PERFORMANCE OF UK SMBOS

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ABSTRACT

This thesis investigates the operating performance of companies following secondary management buyouts (SMBOs) and the factors which determine that performance. First, we find strong evidence that SMBOs underperform in the long run in terms of profitability, productivity, employment growth, and sales growth. This underperformance can be explained by the high level of leverage used in the buyout model, according to the regression results of the significant and negative relationship between leverage and post-SMBO operating performance in profitability and productivity. Nevertheless, our results suggest that another traditional buyout performance determinant, managerial ownership, does not affect post-SMBO operating performance. Moreover, further analysis of the determinants of the post-SMBO performance from the perspective of the board of directors reveals that having more private equity (PE)-related directors on the board and appointing skilled inside directors will both significantly improve post-SMBO operating performance, especially growth ratios. Replacing the top managers and having independent outside directors has little influence on post-SMBO operating performance. Finally, we turned to the impact of PE firms and funds on post-SMBO operating performance. We demonstrate that selling pressure is associated with better profitability, indicating that PE funds under selling pressure tend to exit good companies. Meanwhile there is little evidence to show that PE funds under buying pressure tend to invest in bad companies. Likewise, there is little evidence to support the hypothesis that previous industry experience, number of investments per executive, and buyout/acquisition stage specialization of buying PE firms enhance post-SMBO operating performance.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

A leveraged buyout (LBO) involves a form of takeover in which private equity (PE) investors, and often a company's management team, buy shares of that company from its current owners to create a new independent entity with a new (typically) highly leveraged financing structure (Gilligan and Wright, 2012). Prior to the buyout, the company may have been listed on a stock market, a division of a larger corporate or a privately held/family firm.

A secondary management buyout (SMBO) is a buyout of a buyout in which the initial (primary) buyout is acquired by a new set of PE financiers and/or management, together with new borrowings.[1] Global SMBO transactions, as a fraction of all global buyout transactions, increased from 2% in the 1980s to 26% in 2007 (Kaplan and Strömberg, 2009). By 2011, one in four PE deals in Europe was an SMBO (Smit and Volosovych, 2013). Consistent with this global trend, the number of UK SMBOs also increased until 2007. After a slow down during the recent financial crisis, the number of SMBOs has continued to increase since 2009. Recent years have also seen an increase in the average value of SMBOs. The above trends resulted in an increase in SMBOs' share of the total value of UK deals from 4.6 per cent (in 2000) to 45 per cent (in 2010) (Zhou et al., 2014). The popularity of SMBOs thus raises the opportunity to examine important questions regarding the life-cycle, longevity, and the sustainability of gains on PE investments/buyout transactions.

The UK buyout market is the second largest market after the US. For instance, the enterprise value of UK LBO transactions accounted for 15% of the enterprise value of global LBO transactions during the period from 1970 to 2007 (Kaplan and Strömberg,

[1] Our definition of SMBO is different from the definitions of some previous studies, where SBO is used to define the deals in which both sellers and buyers are PE firms (e.g. Wang, 2012; Achleitner et al., 2012a).

2009). During the period 2001-2007, the total number of UK LBOs accounted for 28.7% of the total number of world LBOs (Strömberg, 2008). Unlike in the US, both private and public UK companies have to submit an annual report to Company House. This allows us to collect and examine company level data on buyouts.

The evidence on the SMBO performance is not conclusive. For example, some authors suggest an absence of operating performance improvement during post-SMBO period (e.g. Wang, 2012; Bonini, 2013). One the other hand, there is some evidence that PE firms could exit from the primary round early, thus leaving some room for further improvement (e.g. Jenkinson and Sousa, 2014). Some of the improvements could also be related to PE firms and/or managers novel strategies and expertise (e.g. Wang, 2012; Arcot et al., 2014). The above studies tend, however, to focus on short term performance of up to 3 years.

Furthermore, the majority of previous studies on post-SMBO operating performance are grounded in Jensen's (1989) agency theory which is more likely to support the efficiency (mainly profitability) improvement of public to private (PTP) buyouts. Nevertheless, SMBOs are different from PTP buyouts and entail fewer agency problems. An entrepreneurship strategic perspective which highlights the importance of using various resources to exploit growth opportunities could therefore provide insight into the performance of SMBOs.

In addition, there is a debate in the literature (e.g. Wright et al., 2009a; Cumming et al., 2007) on whether the traditional corporate governance mechanisms of buyouts, including high leverage, managerial ownership, and the board of directors, could still improve operating performance in SMBOs. Nevertheless, no studies have empirically examined the impact of these three corporate governance mechanisms on post-SMBO

performance, except from Smith and Volosovych (2013). However, Smith and Volosovych (2013) only focus on the impact of governance mechanisms on profitability of PE-backed SMBOs. Moreover, with regards to board of directors, they only investigate the proportion of PE-related directors, board size, and management change, which do not comprehensively explain SMBOs' boards. Therefore, we investigate these relationships in this thesis more comprehensively.

Finally, there are no previous studies on the importance of the longevity of PE funds and PE firms' characteristics (competitive advantages) on the post-SMBO operating performance improvement. Hence, we also examine the relationships between the longevity of PE funds and PE firms' characteristics and post-SMBO operating performance.

We manually collected company level data and data on PE firms from various sources. The SMBOs deals and basic deal information were identified from the Center for Management Buyout Research (CMBOR), the most comprehensive database covering UK and European PE and buyouts. The accounting data and leverage data for the target companies of SMBOs and the controlled companies were retrieved from the FAME database from 3 years before to 5 years after SMBO transactions. Managerial ownership was manually calculated from the shareholder reports in the annual returns obtained from Keynote. The information on the directors in the board (from 3 years before to 5 years after SMBO transactions) was collected from a combination of sources including, for example, company websites, PE firm websites, and personal profiles. PE firms' data and further SMBOs' deal level data are available from Thomson One Banker.

Our initial SMBO list has 612 deals, which is the most comprehensive UK SMBO list to date. The sample sizes used in the empirical chapters, however, vary because of variations in the objectives of the individual empirical chapters. We mainly investigated

SMBO completed in the period from 2000 to 2007, which covers the period of the 'hot' credit market and 'cold' equity market, and allows us to examine post-SMBO performance over 5 years.

Chapter 1 reviews the extant theoretical and empirical literature on PE and buyouts. In order to draw a full picture of post-buyout operating performance, agency theory and empirical evidence in both the first and second buyout waves are reviewed, together with an overview of buyout and PE transactions. More importantly, an emerging theory of strategic entrepreneurship perspective is explored in this chapter to complement the drawback of agency theory. Chapter 1 also reviews the theory of corporate governance in buyout and relevant empirical studies. Finally, we review agency theory in PE firms and the influence of PE firms on buyouts' performance. Based on the literature review, several critical research areas were identified and pursued in this thesis.

Chapter 2 is the first empirical study on post-SMBO operating performance. We use five operating performance measures, including profitability (*ROA* and *ROS*), productivity, employment growth, and sales growth, and employ different matching methods to estimate post-SMBO abnormal performance. We obtain strong evidence that SMBOs underperform after transactions, especially in terms of profitability and growth. Moreover, we firstly examine the impact of leverage and managerial ownership on post-SMBO operating performance with a panel dataset. It is found that, contrary to its positive impact on post-buyout operating performance, leverage shows a negative impact on post-SMBO operating performance. Similarly, the results suggest that managerial ownership do not improve post-SMBO operating performance.

Chapter 3 extends the analysis by taking account of the board of directors as a determinant of post-SMBO operating performance. We find that the fraction of PE

specialists on the board significantly improves post-SMBO operating performance. Meanwhile, the attendance of skilled insider directors leads to better post-SMBO performance with regard to growth in particular. However, we do not find solid evidence to support a relationship between post-SMBO performance and changing the top managers or having independent outside directors. Moreover, we find that these results are influenced by the reputation of PE firms and whether the SMBOs are exited early or late by primary investors. This chapter contributes to the small but important literature on private companies and buyouts in terms of board of directors, providing evidence of the importance of board structure on post-SMBO operating performance.

Chapter 4 contains the third empirical study. The SMBO literature survey shows that fund pressures from both the selling and buying sides motive PE firms to sell good deals and purchase bad deals. Also, the literature suggests that the different competitive advantages of PE firms could improve the performance of target companies at different business stages. However, there is gap in the literature on whether these factors really impact on the performance of target companies and result in good or bad deals. Hence, Chapter 4 aims to fill this gap by investigating whether the longevity of the fund (fund pressure) and the PE firms' characteristics (competitive advantages), such as previous industry experience, number of investments per executives, and buyout/acquisition stage specialization can improve post-SMBO operating performance. The results show some evidence that when selling funds approaching to the end of their life, SMBOs outperform in profitability. However, we do not find strong evidence that SMBOs underperform their counterparts when the buying fund approaches the end of itself investing period. We also do not find strong evidence to support our hypothesis that the characteristics (competitive advantages) of the buying PE firms improve post-SMBO operating performance.

The conclusion summarizes the key empirical findings in each of the chapters and their respective contributions to the literature. We conclude with suggestions for future research.

CHAPTER 1

LITERATURE REVIEW

1.1 Introduction

PE and buyout markets have attracted much attention in the literature since they emerged in the US in 1980s. Starting from agency theory, along with the rapid growth and momentum of the PE and buyout markets, new theories from other disciplines have been transferred to this area. As SMBO belongs to the buyout family, our arguments are mainly rooted in dominant and emerging buyout theories.

In this chapter, we first provide an overview of PE and buyouts which help us understand buyout theories and evidence. Moreover, we review the agency theory of buyouts, along with some important empirical evidence on post-buyout performance, which has dominated in the buyouts literature over the last two decades. Then, we provide a comprehensive review of all studies on SMBOs. Next, we discuss strategic entrepreneurship perspective in detail, which complements the agency theory as described. This is followed by a literature survey of three crucial corporate governance mechanisms in the buyout context, namely leverage, managerial ownership, and the board of directors. In addition, we review theories on PE firms and their influence on performance. Finally, we present our research objectives in this thesis.

1.2 An overview of PE and buyouts

1.2.1 PE

There is no consistently-applied definition of PE in the literature and industry. For instance, although the general forms of fundraising and investment are similar between

venture capital (VC) and PE, VC and PE differ with respect to the development stage of the companies in which they invest in the US. In the US, VC invests in young, earlier-stage companies, while PE invests in broader stages which consist of mature, later-stage firms as well as buyouts and turnaround investments (Cumming and Johan, 2009). Sometimes, the concepts of PE and buyout are equivalent in the US literature (e.g. Phalippou and Gottschalg, 2009). Nevertheless, VC has an ambiguous definition in the UK, as the distinction between PE and VC is not clear. In fact, in the literature, PE is a broader term which encompasses VC (Cumming and Johan, 2009; Jelic et al, 2005). Herein, we use the definition of Gilligan and Wright (2012), which states that the PE market provides funds to invest in private companies or de-listed public companies through purchasing shares from existing shareholders and control the companies. Similarly, Metrick and Yasuda (2011) define the PE fund as a financial intermediary who invests the investors' capital directly in private companies and then actively monitors and assists the companies to improve performance, in order to maximize its investment return by exiting the target company via IPO and trade sales.

PE is part of the investment class, distinguished from traditional institutional investors. Within PE there are four main asset subclasses in terms of the investment stage: VC, mezzanine, buyouts, and distress (Metrick and Yasuda, 2011). VC and buyouts account for the majority of investments. Unlike early stage VC investments that funds are usually invested in early stage companies, buyouts are usually invested in late stage companies. Meanwhile, VC transactions are accompanied by multiple investment rounds, while a particular feature of financing buyouts is that it is typically a one investment round deal. The mezzanine category is in between and overlaps with VC and buyouts, comprising 'the later stage VC and the subordinate debt layer of buyouts' (Gilligan and

Wright, 2012, p.28). The distress category targets mature and distressed companies. It also can be treated as a special buyout.

Most PE firms are typically viewed as limited partnerships in which limited partners invest most of these funds and the general partners manage these funds. Therefore, limited partners are investors of PE firms (general partners). Limited partners typically include pension funds, banks, life insurance companies, endowments, wealthy individuals, and other institutional investors (Wright et al., 2009a) while the funds' managers (PE firms) are recognized as the general partners. Moreover, PE funds are different from the traditional investment assets of stocks and other assets such as hedge funds, according to the characteristics of Metrick and Yasuda's (2011) definition. PE funds are financial intermediaries between sources of funds and entrepreneurial firms, with a limited life time of on average 10 years (Kaplan and Strömberg, 2009). As discussed, the PE funds mainly include pension funds and funds from other institutional investors such as sovereign wealth funds that require superior returns. Recently, however, new types of entrants, particularly hedge funds, have entered the PE market, bringing out new issues (Siegel et al., 2011). In addition, general partners will receive a management fee and carried interest for the raised fund. The management fee is a fixed fee, while carried interest is based on their investment performance consisting of about 20% of the realized return on investment (Metrick and Yasuda, 2010).

The PE investment can be divided into four processes: selecting, due diligence, monitoring, and exiting. After fundraising, PE firms will identify potential high quality target companies. This process involves PE firms' ability and network to access deals, or generate deals, because there are limited deals in the market (Gompers and Lerner, 2000). Once PE firms and the selling shareholders of the target companies make a non-binding

offer agreement, PE firms will enter to due diligence process to scrutinize the inside information such as the financial report, strategic plan, and management team to minimize the investment failure risk. If after due diligence, PE firms are still confident in this deal, they will negotiate the price, management incentive scheme, and the final instruments etc. The monitoring process refers to PE firms' actively monitoring the target companies and drawing on their expertise to create value for the target companies.[2] Finally, because PE funds are characterized by the financial intermediaries with a limited contractual lifetime, special mechanisms are needed to return money to investors, which concerns with the exit strategy. Moreover, although PE investors as the shareholders can obtain dividends during the holding period, the main sources of the return will be the exit value which could be generated by PE firms (Wright et al., 2009b). The main exit ways include IPO, trade sales, SMBOs, recapitalization, and bankruptcy. In an IPO the portfolio companies sell shares to investors of the public. In trade sales the PE firms sell the portfolio companies to a third party which is referred to acquisition (Cumming and Maclntosh, 2003). Typically, the buyers are strategic acquirers. SMBOs are different from acquisitions in that the management and other investors will retain their investments. Recapitalization allows equity holders to realize a return by taking a sizable dividend through receivership/liquidation. Bankruptcy involves the failure of portfolio companies.

1.2.2 Buyouts

Broadly, there are two types of buyouts: insider-driven and outsider-driven buyouts with different vendor sources (Wood and Wright, 2009; Wright et al., 2009a). Insider-driven buyouts include management buyouts (MBOs) and management-led employee buyouts where usually the existing management team of the target company buy out and

[2] We will discuss details in the following sections.

control the company. Outsider-driven buyouts mainly comprise management buy-ins (MBI), where a new management team, whose leading members are outsiders, take control of the target company, and investor-led buyouts (IBOs) where typically PE firms take control of the target company. The various vendor sources are public-to-private (PTP) buyouts, divisional buyouts, SMBOs, buyouts of public sector, buyouts of family-owned companies, and buyouts of companies in companies in the receivership process.

The majority of buyouts are backed by PE firms. Typically, PE firms establish a new independent entity ('Newco') to buy a controlling stake or equity of an existing company, using their own funds together with high debt financing. This new company is specifically for the purposes of the buyout transaction and is usually just a shell company with nominal capital and temporary directors (Axelson et al., 2013). If the target company is public, the PE firms will pay 15%-50% over the current prices of the stock (Kaplan, 1989a; Bargeron et al., 2008, cited in Kaplan and Strömberg, 2009, p124). Usually, the buyouts will be financed with 60%-90% debt (Kaplan and Strömberg, 2009).

1.3 Buyouts – theory and empirical evidence based on agency theory

1.3.1 Agency theory of buyouts

The agency problem arises when owners and managers are separated, ownership is dispersed, and the information asymmetry exists between shareholders and managers (Jensen and Mecking, 1976; Fama and Jensen, 1983). In an imperfect market, the information asymmetry exists between the informed entrepreneurs and uninformed investors, resulting in the moral hazard that lowers investor earnings by investing in alternative projects (Chan, 1983). In other words, the separation of ownership and control tends to prevent stakeholders from being fully informed. Managers (agents) will not be

motivated to fulfill their obligations to the shareholders (principals), resulting in 'agency costs'.

Agency theory views that the essential value creation resource of buyouts is achieved through eliminating the agency problems between investors and targeted companies.[3] With respect to adverse selection issues, when selecting investee companies for investors, PE firms as financial intermediaries between investors and targeted companies (Sahlman, 1990) help investors invest in the optimal project (screening ability) and improve their welfare. Cumming and Walz (2010) state that PE firms exist because of the information asymmetry and the agency problem between investors and targeted companies in financing activities, and the lack of time and skill for investor to choose suitable companies in which to invest. PE firms monitor the management to eliminate the agency costs. Compared to alternative information intermediaries such as banks, relevant research finds that PE firms have higher screening quality and better monitoring abilities (e.g. Campello and Da Matta, 2010; Winton and Yerramilli, 2008).

With regards to the moral hazard problem, Jensen (1989) argues that a new organization backed by 'active' PE firms, usually with the management team as owners and high leverage, could eliminate the agency problem in public companies, without destroying the crucial functions of liquidity and risk diversification which only exist in public equity markets. According to Jensen (1989), the outbreak of the moral hazard problem occurs when managers reinvest free cash flow, which is the cash flow in excess of the necessary amount to fund projects with positive returns. In mature industries where the companies are rich in cash instead of having growth prospects, management teams have

[3] Some studies also argue that wealth might be transferred from other stakeholders, for instance tax (e.g. Lowenstein, 1985) and employments (e.g. Kaplan and Strömberg, 2009), or generated through pricings of buyouts (e.g. Achleitner et.al. 2011). Because we only focus on operating performance perspectives, we do not discuss them in detail.

few incentives to distribute the free cash to shareholders. Rather, they are motivated to retain this cash to expand the company beyond its optimal size which maximizes shareholders' wealth. In doing so, this money might be invested in unprofitable projects or projects with negative net present value. Jensen (1989) considers buyout as a superior form of organization with superior corporate governance, because that the high leverage, that management team participation in ownership, and the PE firms' monitoring and/or intervening companies' operations enhance the efficiency of corporate governance, and hence motivate managements to behave on the behalf of shareholders and maximize their value.[4]

Wright et al. (2009a) conclude that over-diversification is another aspect of the agency problem of buyout target companies. Over-diversification will lead to underperformance of a company. This situation is also a result of weak corporate governance which provides huge room for PE firms to improve. As a consequence, these companies will obtain the preference of PE firms.

In sum, through resolving the agency problems between shareholders and managers, the target companies of buyout would have efficient corporate governance and better operating performance.

1.3.2 Empirical evidence on post-buyout performance

1.3.2.1 First buyout wave

It is well documented by empirical evidence that buyout companies in the first buyout wave, which started in US in the 1980s, experience average improvements in operating performance after transactions or better performance than their industry peers (See Panel A in Table 1.1). For instance, Kaplan (1989a) finds that the ratio of operating

[4] We will discuss the superior corporate governance mechanisms in the following sections.

income to assets or sales is increased by 7.1% to 36.1% in the first three years after buyouts, using the data of 76 US PTP MBOs. The ratio of capital expenditure to assets and sales is reduced by 4.4% to 31.6%. As a consequence, the ratio of net cash flow to assets or sales is increased by 28.3% to 85.4. Similarly, after studying 58 US PTP MBOs over the period of 1977-1986, Smith (1990) finds a significant increase in both unadjusted and industry adjusted operating returns, measured by operating cash flows deflated by operating assets and the number of employees, after buyout transactions. The author highlights that the increases is attributed to the tightened working capital, but not layoffs and reductions in capital expenditures after buyouts. As noted in Singh (1990), US buyouts companies have higher sales growth than the average industry values before going public. With the data of US LBO in the late 1980s, Opler (1992) confirms the positive influence of buyouts on operating performance of target companies by finding a 11.6% rise in the industry adjusted ratio of operating profits to sales and a 40.3% rise in the industry adjusted ratio of operating profit to the number of employees in the first one to two years after buyouts.

In spite of the dominance of US evidence in the first wave, we can still find consistent evidence from countries other than the US, especially the UK. For example Wright et al. (1992) find 68% of their sample UK MBOs and MBIs show increases in profitability after transactions. By examining the long term effects of UK MBOs, Wright et al. (1996) document that MBOs completed in the mid-1980s generate a significantly higher return on assets than comparable non-buyout companies in the third to fifth post-buyout years, following the first two years in which no significant differences are identified and followed by the sixth year in which the better performance disappears. The authors find a similar pattern when using the profit to the number of employees ratio.

Their results suggest that the superior performance of MBOs is a long term phenomenon.

Insert Table 1.1 about here

1.4.1.2 Second buyout wave

Along with buyouts spreading to Europe, empirical research gradually focuses on the buyouts in Europe from the 1990s to 2000s, the second wave of buyouts, as the financial data of private companies is available in some European countries. Unlike the evidence from the first wave, evidence on the strong and positive effect of buyouts on performance from 1990s and 2000s is less convincing (See Panel B in Table 1.1). For instance, comparing 122 UK buyouts companies between 1995 and 2002 with a control sample of non-buyout companies, Cressy et al. (2007) demonstrate that PE-backed buyouts companies have a 4.3% greater operating profitability and 6.97% greater turnover growth than those of the compared non-buyout companies during the first 3 years after buyouts. Amess and Wright (2007) also find that employment growth for UK MBO companies is 0.77 of a percentage point, against 0.26 of a percentage point for non-buyout companies, suggesting better performance. Similarly, in a sample of Sweden buyouts between 1999 and 2001, Bergström et al. (2007) find a significant increase of 3.07%, 17.38%, and 3.45% in post-buyout operating profitability as measured by EBITDA margin, return on invested capital, and sales growth, respectively. As noted in Acharya et al. (2013), buyouts in Western Europe also evidence significantly positive abnormal operating performance after transactions, although the magnitude is much smaller than those in the 1980s. Boucly et al. (2011**)** claim that French private companies are under credit constraints which prevent them from taking advantage of growth opportunities, while the PE firms help them to relax from the credit constraints after buyouts and improve the companies' performance. After examining the data, they find that the sample buyout

companies have higher profitability and growth than the non-buyout control sample.

In contrast, by studying 192 PTP LBOs in the US between 1990 and 2006, Guo et al. (2011) find significantly smaller increases in post-buyout operating performance compared to those of Kaplan (1989a), and even, the significance of better performance depends on the measures of performance they adopt. For example, the best performance improvement in their study is a 14.3% significant increase in performance adjusted net cash flow (using industry, performance and M/B ration as adjusted benchmark). However, if using the industry adjusted benchmark, the significant increases in net cash flow disappear and the same holds for other operating performance measures. Likewise, through studying 110 French buyouts over the period from 1988 to 1994, Desbrières and Schatt (2002) find deteriorations in return on equity, return on investments and margin ratios (EBIT/Sales, Net profit/Sales, and Cash flow/Sales) of buyout target companies over the two years after the transactions compared to their industry peers.

In addition, not being restricted to a particular buyout period, Jelic and Wright (2011) collected 1,225 UK MBOs completed between 1980 and 2004, and examined their long term post-buyout and operating performance in terms of profitability, operating efficiency, output, dividend payments, employment, and leverage. Though abnormal performance in leverage and operating efficiency are not significant, the authors obtain strong results showing improvements in profitability, output, and employment. However, the improved performances of profitability and employment only last for three years while that of output continues over five years. Moreover, the authors find significant decreases in dividend payments, up to five years after buyout transactions. Consistent with these results, Weir et al. (2008) also find mixed evidence when investigating the UK MBOs from 1998 to 2004. For example, the sample companies only significantly outperform their industry

counterparts in return on capital equity in the second post-buyout year. Even underperformance in return on capital equity is observed in the first post-buyout year. EBITDA figures also show underperformance in some post-buyout years.

1.4 SMBOs: motivations and performance

1.4.1 Motivations for SMBO transactions

Along with the boosting of SMBOs in this decade, the motivations of SMBOs attract a great deal of attentions from academics. In this section, we summarize the current motivation hypotheses raised and/or examined by different scholars. These hypotheses are not mutually exclusive.

1.4.1.1 The characteristics of company hypothesis

Wright et al. (2000b) argue that one explanation of SMBO or SMBI (secondary management buy-in) could be from the company itself. First, the authors propose that small or medium-sized buyouts may not be attractive to both going public and trade sales routes. With regards to going public, the entrance of small or medium-sized companies to the stock market is narrowed down. Though fast-growing companies are more likely to finance new capital in the stock market, it will be problematic when floating small or medium-sized buyouts because of the lack of liquidity of the companies' stocks caused by the lost interest of institutional investors in small listed companies. In respect of trade sales, buyouts exiting through trade sales could also be a problem when the company is too small, because strategic buyers do not seem to buy very small businesses in view of preference for the scale economy. The costs of this transaction could not be made up by the gains of this small business. Also the marginal contribution of purchasing a small business might be too small to be attractive to the large acquirer, although the market position could be in conjunction with the strategy of the acquirer. Second, if the companies

are original private or family owned, they are more likely to maintain their independence. Third, companies with stable market shares in a niche market but with lower growth prospects, such as the companies in traditional manufacturing industrial sectors, may also tend to choose SMBO as a route to maintain their independent identity.

However, after studying 229 UK SMBOs/BIs from 1984 to 1997, Wright et al. (2000b) do not find that SMBOs/BIs tend to be small to medium-sized companies. Similarly, the originally subsidiaries or family owned companies do not have more chance to become the target companies of SMBOs/BIs, related to others. In contrast, the authors find that the industrial sector of the company is a crucial factor that determinates the SMBOs/BIs transactions. Likewise, Harford and Kolasinski (2010) studied 788 US large buyouts from 1993 to 2001, tracking exit status through 2009, and find that SMBOs tend to happen in concentrated industries.

1.4.1.2 Incumbent management team hypothesis

In the same study, Wright et al. (2000b) also highlight the importance of the incumbent management team on SMBOs. They claim that some managers may have a long-term faith in a company. They think their objectives could be achieved in a long-term organization. Through maintaining the companies as independent, which eliminates the threat from hostile takeovers and scrutiny from the stock market, the managers are able to continue their control of the company. Hence, SMBO becomes their preferred choice when primary buyouts exiting. Second, managers may need SMBOs to finish their restructuring and entrepreneurial strategies which could not be completed during the primary buyouts period. By studying the cases of six companies, the authors find that managers in three companies among the six confirm that, to some extent, maintaining the continuity of the companies motivates them to seek a secondary buyout or buy-in. For instance, in order to

avoid a takeover, VC firms will seek outside managers to buy-in the companies when the lead buyout manager retires and no other managers in the company can provide the required expertise. Alternatively, the buyout managers depart from the companies while the remaining managers, taking the second tier managers as an example, substitute their positions through a new buyout. Also, three companies show that SMBOs/BIs occur as the companies required further financing to continue the strategies, providing evidence on the motivation of finishing the uncompleted restructuring and entrepreneurial strategies.

1.4.1.3 Fund pressure hypothesis

Fund pressure could be considered from two aspects: the selling side and the buying side. In respect of the selling side, PE funds usually have a contractually limited life of 10 years and hence the holding period of one buyout is, on average, around five years (Strömberg, 2008). When the fund approaches the end of its lifetime, the primary PE firms will be forced to exit the buyouts (Achleitner and Figge, 2014). Delayed exit would be viewed as a lack of skills by the limited partners (Arcot et al., 2014). Moreover, PE firms usually raise new funds every three to five years (Phalippou and Gottschalg, 2009). In order to facilitate fund raising, PE firms may exit early to make a track record for reputation enhancement, because the length of the holding period and the return of the current fund is one of the key measurements for a limited partner to estimate the PE firms (Jenkinson and Sousa, 2014; Achleitner and Figge, 2014; Arcot et al., 2014). In addition, PE firms will exit in a limited holding period in order to achieve a stable cash flow profile, even though the funds are still within the contractually fund lifetime (Strömberg, 2008; Achleitner and Figge, 2014). When PE firms are under pressure to exit from the primary buyouts, the target companies might not be ready to go public or be sold to other companies and hence SMBOs will be viewed as the best choice (Cumming and MacIntoch,

2003). Jenkinson and Sousa (2014) document a positive association between the likelihood of SMBOs and the length of the holding period. When going public is impossible in a short period, SMBO becomes an attractive exit choice to keep a good investment record for the PE firms. Harford and Kolasinski (2010) also find that when the sponsor has held the portfolio firm longer, suggesting an inability to exit in a timely manner, the primary PE firms will exit to a financial buyer through a SMBO. Arcot et al. (2014) create an index to proxy for the selling PE firms' pressure related to the reasons we discussed above to investigate the motivation of SMBOs from selling pressure. They find that when selling PE firms under more selling pressure, a one unit increase in the index will increase the likelihood of SMBO exit choice by up to 12%.

From the buying side, Arcot et al. (2014) and Achleitner et al. (2012a) argue that the huge untapped capital in the hand of PE firms could be an important motivation of SMBOs. This is because letting the unspent capital expire will impact the perception of limited partners on the general partners. When approaching to the end of the investing period, after around four to six years, PE firms are keen to spend the huge unspent capital. SMBOs as easily reached and quick to complete deals become attractive. Furthermore, low-reputed or young PE firms usually have limited access to new or good deals, and hence SMBO is attractive to them due to its low costs and low risk, as primary PE firms have already done due diligence (Arcot et al., 2014). Achleitner et al. (2012a) demonstrate that the amount of untapped committed capital impacts positively on the likelihood of SMBOs. Arcot et al. (2014) also create an index for the buying pressure related to these reasons and find that buying PE firms under more buying pressure tend to be involved in SMBO deals. A one unit increase in the buying pressure index leads to about an 18% increase in the probability of SMBO deals. Moreover, they find the selling and buying

pressures have an impact on SMBO pricing. More specifically, buying PE firms that are under pressures are likely to pay more for buying out deals, while selling pressure may make selling PE firms accept a lower price to sell the deals. In this respect, however, selling PE firms have more bargaining power over the buying ones. Although it is not their main interest, Jenkinson and Sousa (2013) find SMBO transactions are likely to cluster in the later part in the buying fund life compared to primary buyouts.

1.4.1.4 Pecking order hypothesis

In the literature, SMBO is viewed as a last resort when considering the exit route. Cumming and MacIntosh (2003) propose that there is a pecking order of PE firms' exit routes and suggest that PE firms exit companies depending on the companies' quality. They state that a PE firm will exit once the marginal profit is negative, suggesting that the value creation competences are exhausted and there is no further value creation. The going public and trade sales would be the first choices for exiting, because they could enhance the reputation of PE firms and bring in more earnings. In particular, PE firms exit the best-quality companies through going public. However, when the two best exist routes are unavailable, a SMBO may be adopted. Moving from the same theoretical argument, Bienz and Leite (2008) suggest that PE firms chose going public as an exit route for highly profitable companies and trade sales for companies with less profitability, while SMBOs are used as an exit route when going public is not available but companies are highly profitable. In addition, in conjunction with the development of the portfolio company, the effect of value added by PE firms will decline over the time (Simth, 2005). The closer to the funds maturity, the likelihood of SMBOs is higher and the prices of SMBOs are lower (Jenkinson and Sousa, 2014). The discount for buying a SMBO company indicates that SMBOs are the second best exit alternative for the exit strategy (Kitzmann and Schiereck,

2009), because second PE firms could not realize positive returns on their investment based on the former PE firms' effects and primary PE firms will not achieve high returns of investments.

However, recent empirical results refute the pecking order of exit channels hypothesis. In an analysis of 759 European PE exits, Jenkinson and Sousa (2014) examine the motivations of SMBOs. They find a negative relationship between the probability of IPO as an exit routes and the companies' profitability. By contrast, SMBO becomes more attractive due to the higher EBIT margin and lower ratio of capital expenditure to assets both of which suggest a high debt capacity. In an analysis of 1,112 LBOs from Europe and North America over the period of 1995 to 2008, Achleitner et al. (2012a) also confirm that an SMBO is not a last resort, as their results do not show significant and positive results for the relationship between the equity returns and both IPO and SMBO exits. Besides, Kitzmann and Schiereck (2009) investigate the worldwide exit transactions between 1999 and 2004, and find the profitability of exiting through SMBO is not significant different from exiting through trade sales. Thus, they state that SMBOs cannot be seen as a second best alternative, compared with IPOs and trade sale.

1.4.1.5 Value creation hypothesis (or Efficiency gains hypothesis/ Specializations hypothesis)

Some scholars argue that value creation potentials could be one motivation of SMBOs (Wang, 2012; Jenkinson and Sousa, 2014; Bonini, 2013; Arcot et al. 2014). The former PE firms cannot use all performance improvement potential of the target companies if they exit early and ultimately secondary PE firms and or management can benefit from the remaining potential (Wang, 2012; Achleitner and Figge, 2014). Alternatively, drawing on the theory of the strategic entrepreneurship perspective and the

heterogeneity of the competitive advantages of PE firms, the new PE firms may possess specific complementary knowledge and skills to those of primary PE firms (Wang, 2012; Jenkinson and Sousa, 2014; Bonini, 2013; Arcot et al., 2014). For instance, some focus on early-stage while others prefer expansion or late stage phases. Some first-time LBOs targets are smaller private companies, and such companies are invested by relatively small PE firms. When the targets mature and expand, the small PE firms are unable to manage them based on their limited experience and human resources. Therefore, it is more optimal to be sponsored by bigger PE firms with more personnel and experience. Also, if the target companies demand special skills or resources which the primary PE firms do not possess, the following PE firms with these special skills or resources might buyout these companies to create additional value (Arcot et al., 2014).

Nonetheless, the empirical evidence on this argument seems to reject it. Bonini (2013) investigates the operating performance of SMBOs' target companies and compares the operating performance with primary buyouts. Through studying the operating performance of 163 European SMBOs over the period between 1998 and 2008, he finds though operating performance (measured as operating margins ration, turnover ratio, return on investments, return on equity, liquidity ratio, and capital structure ratio) of SMBOs are superior to the industry average performance, those of first-round buyouts (primary buyouts) have premiums to a much more extent. Moreover, the superior performance in secondary round declines over time and even reverts to the industry benchmark. He concludes that SMBOs, per se, do not improve the performance of target companies and rejects the value creation motivation hypothesis. Instead, SMBO investors tend to select better deals in which to invest. This result is further confirmed by Wang (2012) who does not find strong evidence on the performance improvement of target firms

after SMBOs based on a study of 485 UK SMBOs. She finds that both profit and profitability (unadjusted and industry adjusted) experience significant increases before SMBO transactions, whereas after the transaction profit continues to increase but profitability does not. In fact, profitability deceases significantly after transactions. In conjunction with the significant post-SMBO growth in fixed assets and sales, she concludes that SMBOs do not improve the target companies' efficiency. Although Jenkinson and Sousa (2014) support the differences between PE firms motivating SMBO deals, the differences are only related to the PE firms' competence on generating good primary buyouts whereas not the value creation potentials such as fast growing or performance improvement.

1.4.1.6 Debt capacity hypothesis

Investors could be attracted by the high debt capacity of target companies and decide to invest in an SMBO (Achleitner et al, 2012a; Bonini, 2013). As a symbol of buyout, high debt plays an important governance role in buyout organization model (Jensen, 1989). Through the primary stage, the target companies are suitable for the high debt model, with robust and stable cash flow generation ability. As a consequence, target companies can sustain a high debt burden. Moreover, the management team is seasoned in tackling the constraints imposed by the highly leveraged capital structure and working with PE firms (Wang, 2012). In addition, the banks show a preference for SMBOs (Wang, 2012), because they are familiar with the situations of the portfolio company and the information asymmetries between them are relatively low in comparison with primary buyouts (Achleitner and Figge, 2014). Achleitner et al. (2012a) use EBITDA margin and leverage at primary buyout exit as proxies for debt capacity to examine this hypothesis. They find that target companies with a high debt capacity are more likely to exit through

SMBO, compared to going public and sale trade.

1.4.1.7 Collusion hypothesis

Wang (2012) suggests collusion between PE firms as one possible motivation of SMBOs, because the collusion between PE firms seems to be inevitable in a favorable environment caused by the settled PE firm players in the PE market and the opacity and lack of regulation in the PE industry. Collusion could be used by PE firms for trading bad portfolios and artificially boosting returns through exchanging the portfolios between each other at a higher than market price. When a PE firm cannot exit a portfolio through good exit routes such as going public and trade sales, or cannot obtain an expected return, it may seek help from another PE firm to acquire this portfolio. As a consequence, SMBOs could be a means of collusion at the expense of both ultimate investors (limited partners) and target companies. This is because if the portfolio performs badly, there is little chance for buyers to obtain a return; if the price is higher than the market price, the profit returns to the ultimate investors will be discounted. With respect to the target companies, no matter worse performance or higher buying prices, the target companies' debt burden is likely to increase and could be beyond their competence. If there is not enough improvement in operating performance, which is considered to be limited or rare, the target companies are very likely to go bankrupt after several buyouts (e.g. going through SMBO, tertiary buyouts). However, after investigating the buyout pattern of PE firms in the SMBO market that shows the frequency of PE firms' mutual transaction, Wang (2012) fails to provide evidence to support the collusion hypothesis. Consistent with Wang (2012), Bonini (2013) uses a sample of 163 European SMBOs to test the buyer-seller frequency of SMBO transactions, and does not find convincing evidence of collusion.

1.4.1.8 Market conditions hypothesis (or Mispricing hypothesis)

Wang (2012), Jenkinson and Sousa (2014), Bonini (2013), and Achleitner et al. (2012a) point out that the current SMBO wave is determined by current market conditions. They document that PE firms would arbitrage opportunities in accordance with the market conditions to achieve the optimal exit price. On the one hand, the equity market that drives both IPO and trade sales deals is especially crucial for PE buyouts due to the nature of exit routes. The existence of cycles in equity market suggests IPO and trade sales are not always at hand. For instance, Baker and Wurgler (2002) state that when the equity market is 'hot', more IPOs are issued. Mulherin and Boone (2000) find there is a positive correlation between merger waves and the high stock valuation and economic expansion. When the equity market is 'cold', IPOs and trade sales are less available exit routes. As a consequence, primary PE firms will resort to alternative exit routes and hence, the access to SMBOs may be favored by primary PE firms.

On the other hand, buyout activities depend less on the equity market but more on the debt market (Wang, 2012). When companies issue securities, managers tend to use the mispricing in equity markets. It is possible to have the same phenomenon on the debt market (Baker and Wurgler, 2002). The debt market periodically experiences boom and bust, so that the investors are unable to require the accuracy interest rate of their debt investments according to the fundamental risk of the borrowing firms. Especially, when the debt market is 'overheated', investors could endure losses due to the underestimation of the interest rate, while managers could take advantage of this imperfection and issue more debt (Axelson et al., 2013). In line with this view, Axelson et al. (2013) suggest that PE firms will mediate the conditions between equity and debt markets when the debt market is 'overheated', through increasing leverage of deals. They find that PE firms pay

higher prices for each deal due to the easy availability of credit. Hence, the SMBOs can achieve more returns for the primary investors compared with other exit routes when the credit market is 'hot' (Jenkins and Sousa, 2014).

In addition, Bonini (2013) and Wang (2012) claim that the secondary PE firms will expect to obtain profits from the increases in debt, so they tend to invest in portfolio companies with lower debt and higher capacity to generate earnings and cash flows. This is because companies with these characteristics have advantages of lower default risk and higher tax shield benefits.

The current empirical findings strongly support this hypothesis. For instance, Jenkinson and Sousa (2014) utilize the Fed tightening index and return on the local stock market index as proxies for the states of the credit market and the IPO market, individually. They find that the both indices regress positive and significant effects on the likelihood of an IPO in comparison with an SMBO, suggesting that loosening the credit market and the underperformance of the stock market increases the attractiveness of SMBOs. In line with these results, Wang (2012) finds that the 'hot' condition of the equity market has a significant negative relationship with the probability of SMBO exit, whereas a 'hot' debt market shows a positive association. In order to investigate the combined effect of the two markets, the author conducts a matrix analysis and finds that 77.6% of all SMBO exits happen under the conditions of a 'cold' equity market, while the debt market is 'hot'. Bonini (2013) also demonstrates that the attractiveness of SMBOs is increased by cheap debt. However, he finds that high prices have a negative relationship with the likelihood of an SMBO exit. Using the annual amount of loans issued for LBOs at the penultimate exit year as a proxy for the debt market liquidity, Achleitner et al. (2012a) find that the increase in the annual amount of loans for LBO leads to the increase in the probability of exiting

via SMBOs, supporting the hypothesis of 'hot' debt market conditions driving SMBO deals.

Insert Table 1.2 about here

1.4.2 SMBOs' performance and its determinants

Achleitner and Figge (2014) focus on the value creation of SMBOs in terms of three values creation drivers: pricing, operating performance, and leverage. First, they hypothesize the potentials of operating performance improvement in the secondary round. More specifically, the potentials are reflected in the similar EBITDA growth and the higher sales growth than those in primary buyouts but not in the EBITDA margin expansion. Through analyzing 2,456 realized buyouts (including 448 SMBOs) worldwide during the period from1990 to 2010, they find that none of the three operating performance measures is significantly related to financial buyouts (SMBOs as they defined), and hence financial buyouts should have similar value creation potentials to primary buyouts in terms of the three performance measures. On the leverage side, the authors argue that buying PE firms utilize higher leverage than primary buyouts to boost equity returns, which is theorized by the leverage-relevant theory we discussed above. Using two leverage ratios (debt/equity and debt/EBITDA), they confirm this hypothesis with the findings of significant and positive relationship between the two ratios and financial buyout dummy. Nevertheless, financial buyouts use 28 to30 per cent more leverage to finance the deals. As regards prices, the authors propose higher prices for financial buyouts in comparison to those of primary buyouts, as selling PE firms will time the markets and use their negotiation skill to raise the price. The results show 6-9 per cent higher prices for financial buyouts than primary buyouts and this premium is mainly attributed to the selling PE firms' skills in market timing and negotiation. Finally, because

of the optimistic hypotheses on the three value creation drivers, the authors examine the return on equity as whole effect of financial buyouts and do not find a significant reduction in this ratio, lending support to the argument that an SMBO is not a last resort of exit.

Achleitner et al. (2012b) use the single case study of Brenntag invested by the same PE firm of BC partners in primary and secondary phases, to analyze value creation drivers in SMBOs in terms of operating performance, leverage, and multiple expansion. This method enables them to control for the PE firms' skills in selecting and monitoring. In spite of this, Brenntag still exhibits room for operational improvement in the secondary round. Based on the nine interviews, the authors find that the potentials derive from the forced exit of primary PE firms and the enhanced incentive alignment of the management team which includes the participation of middle managers, increased money investment of existing owner-managers, and the acknowledgement of benefits from management investments. Moreover, as the lenders have been already familiar with the target companies, which causes lower information asymmetry, therefore, buying PE firms find it easy to access to higher leverage. The opportunities to increase multiple expansions, however, are limited due to the similarity of market timing and negotiation skills for both buyers and sellers.

Jenkinson and Sousa (2013) investigate the operating performance of SMBOs by comparing it with that of going public (IPO) deals, by using European data on 194 SMBOs and 114 IPO deals between 2000 and 2007. They find that although SMBOs underperform IPO deals in operating performance as measured by total sales and EBITDA, they outperform their counterparts in terms of net cash flow estimated as EBITDA less capital expenditure because of lower increases in capital expenditure of SMBOs over the same period. SMBOs cut the capital expenditure to pay out debt principals and interest. The

authors find the longer holding period in primary phase and the lack of experience of buying PE firms can partially explain this underperformance.

Smit and Volosovych (2013) have developed a model to reconcile the conflicting views (as discussed above) on SMBOs' value creation potential, in conjunction with the empirical analysis of 101 UK SMBOs from 1999 to 2008. Both the model and the empirical analysis come to the conclusion that SMBOs are motivated by high leverage that is associated with a higher price. They document how the financial sponsors of SMBOs receive significantly large investment returns, thereby providing evidence of value creation. Nonetheless, these returns can be explained by both high leverage with reduced interest rates and a higher exit multiple than entry multiple rather than the operating performance improvement. Actually, the results exhibit no improvement in operating performance during SMBO periods after adopting various operating performance measures and methods. However, the authors dig out some factors that influence post-SMBO operating performance. For example, management replacement, PE firms' monitoring, and pre-SMBO performance can lead to better post-SMBO operating performance.

In contrast to previous studies that focus on the target company's performance, Degeorge et al. (2013) examine the performance of SMBOs from the limited partner side, mainly with regard to investment returns. In the analysis of a unique dataset of 548 SMBOs and 7,449 primary buyouts in the US from 1986 to 2007, they document that regardless of the performance measures (cash multiple, public market equivalent, and internal rate of return), SMBOs underperform the primary buyouts. Notably, SMBOs that happen at a late point in the fund investment period (late SMBOs) underperform others. This underperformance is not experienced by SMBOs made at an early point in the fund investment period or by primary buyouts made at a late point of fund investment period.

Moreover, they find the excess untapped capital can magnify the underperformance of these late SMBOs. These results suggest that PE firms' engage in 'go for broke' behavior in the sense that when the fund approaches the end of investment period, PE firms tend to burn untapped capital. Another interesting finding of Degeorge et al. (2013) is that limited partners on the selling side have about a one in six probability to be on the buying side of the same target companies (LP overlap), with 41% of percentage portfolio rebalancing[5] against 100% for limited partners that are not on both buying and selling sides. These results suggest that LP overlap in SMBOs is not a rare phenomenon and an important consequence of it is the decreases in limited partners' portfolio rebalancing.

Finally, Jelic and Wright (2011) also shed some light on the post-SMBO operating performance and obtain mixed evidence. In consistent with other studies, they observe dramatic reductions in profitability. However, they find gearing also experiences deterioration over secondary phases. In contrast, output, dividends, and operating efficiency improve significantly after SMBO transactions.

1.5 Buyouts-strategic entrepreneurship perspective and performance

Traditional agency theory only emphasizes the buyouts' reduction of costs caused by over-investment and over-diversification, as this theory stems from the buyout of public companies going private. Although PTP LBOs receive heightened attention from the media and research, the majority of buyouts are private-to-private transactions, for example, division buyouts, family buyouts, SMBOs (Strömberg, 2008). However, there is rare empirical research on private-to-private buyouts, and there is little theoretical work to systematically analysis the economic rationale of this type of buyout. Recently, Chung (2011) has claimed that the free cash flow hypothesis of Jensen (1989) does not seem to

[5] Portfolio rebalancing is a measure of fund diversification.

explain the activities of private-to-private buyouts, because the foundation of un-concentrated ownership for free cash flow does not exist in private companies. Therefore, it is desirable to introduce a new theory to the buyout area. Meuleman et al. (2009) thereby introduce the strategic entrepreneurship perspective, known as a resource-based view, into the buyout literature to complement to the limitations of agency theory.

Ireland et al. (2001) and Ireland et al. (2003) integrate strategic management and entrepreneurship and develop a strategic entrepreneurship perspective which highlights the importance of recognizing resources to identify growth opportunities and sustain or generate a competitive advantage for creating company wealth. More specifically, strategic management focuses on using sustainable competitive advantages to create wealth (advantage seeking) (Ireland et al., 2003). Entrepreneurship emphasizes the recognition of opportunities and creating or bundling resources to exploit these opportunities to create wealth (opportunity seeking) (Ireland et al., 2001; Ireland et al., 2003). Obviously, both of these lie at the core of wealth creation. In order to sustain wealth creation, companies have to identify opportunities from the uncertain external environment and develop competitive advantages to exploit them, as in Ireland et al. (2003). Ireland et al. (2003) point out that small or start-up companies possess skills in recognizing growth opportunities but are inferior at exploiting these opportunities in long run. By contrast, mature companies have superior skills in developing competitive advantages but are less effective at recognizing entrepreneurial opportunities. They argue that companies with a strategic entrepreneurship perspective are able to overcome their respective weakness.

In their theoretical paper, Ireland et al. (2001) suggest six domains of strategic and entrepreneurial actions. These are innovations (e.g. research and development), networks between companies and individuals and resources, internationalization, organizational

learning through information and knowledge absorption, corporate governance mechanisms (especially board of directors) and top management teams, and the growth of companies (e.g. mergers and acquisitions). Following Ireland et al. (2001), Ireland et al. (2003) develop a model of strategic entrepreneurship and state the vital position of resources. They argues that opportunity seeking and advantage seeking behaviors are grounded in the rare, valuable, inimitable, non-substitutable, non-transferable, and immobile resources of the companies, which are classified into three categories of strategic entrepreneurship, including financial capital, human capital, and social capital. Financial capital refers to the monetary resources available to companies. Human capital refers to the unique knowledge, skills, experience, and capabilities of the employees and managers. Social capital refers to the internal networks between individuals and the external networks between individuals and organizations.

Grounded in the strategic entrepreneurship perspective, Meuleman et al. (2009) argue that buyouts enable the exploitation and realization of growth opportunities. This is because resources and capabilities are not only related to the knowledge and skill of exiting management to identify the opportunities of value creation, but also associated with the specialist expertise of PE firms (Coff, 1999; Zahra and Filatotchev, 2004). Admittedly, both the knowledge and skills of the existing management and the expertise of PE firms vary between companies and firms. The heterogeneity of resources and capacities leads to various levels of competitive advantages. Some companies will sustain a competitive advantage, while others will enhance it. Building on these ideas, types of buyouts, PE firms experience, reputation, network configuration, and the number of portfolios per PE manager could all impact upon profitability, efficiency, and even the realized growth. Meuleman et al. (2009) argue that the managers and PE firms in

divisional buyouts in particular can improve more performance by using their resources, skills, knowledge, and experience to exploit entrepreneurial opportunities and make strategic decisions. They find that divisional buyouts and PE firm experience have significant and positive influence on performance improvement, especially in achieving growth.

Starting from the concepts of entrepreneurship and strategic growth, Wright et al. (2000a) and Wright et al. (2001) also suggest that buyouts could be a means of wealth creation through properly matching the mindsets of managers (managerial mindsets versus entrepreneur mindsets) with managerial incentives (towards efficiency gains versus towards strategic innovation).[6] They argue that in buyouts where managers have high-powered ownership (managerial incentives towards strategic innovation) and entrepreneurial mindsets (heuristic-based logic as they describe it), which is limited by the bureaucratic procedure before buyouts, upside growth might result from the entrepreneurship decisions of exploiting new opportunities and investing in strategic innovations. For instance, Zarah (1995) uses innovations and new ventures as proxies for corporate entrepreneurship and finds that the increases in innovations and new ventures of LBO companies boost their performance. Using patenting activities to measure innovations, Lerner et al. (2011) show that LBOs do not sacrifice their long-run growth to improve short-run performance. By contrast, the number of patents does not change after LBOs, but the cited patents increase and LBOs become to more concentrated on core

[6] According to Wright et al. (2000a) and Wright et al. (2001), the managerial mindset refers to more systematic decision making based on quantitative and rigorous analysis of historical data, while the entrepreneurial mindset refers to making decisions through unique insights and real world experience regarding the sensitivity of future trends. Managerial incentives towards efficiency gains are caused by high leverage and moderate incentives align between managers and shareholders. Under these circumstances, managers have limited power to invest free cash in high risk but promising projects or innovations. Thus, the efficiency gains are a short term outperformance of buyouts. By contrast, managerial incentives towards strategic innovation are a consequence of the moderate leverage and high-powered managerial ownership with which managers are more flexible to choose investments and prefer to relevant high risk but strategic innovations.

innovations. Furthermore, Wright et al. (2000) and Wright et al. (2001) claim that the mismatch between the mindsets and the managerial incentives could cause underperformance of buyouts. For instance, underperforming buyouts may happen when entrepreneurial managers encounter high leverage, and meanwhile, efficiency should be the main source of wealth creation instead of exploiting new innovations. Underperforming buyouts could also occur when buyouts demand strategic innovation to spur long-term growth while the incumbent managers only have managerial mindsets. As results, the investors might replace existing managers with more suitable managers, for instance, through SMBOs.

1.6 Corporate governance of buyouts and performance

It is well documented that buyouts have superior corporate governance in terms of leverage, managerial ownership, and the board of directors to improve the performance. Herein, we review studies on the respective corporate governance mechanisms (Table 1.3). In particular, we review the theory of the board of directors because of its crucial and special role in SMBOs.

Insert Table 1.3 about here

1.6.1 Leverage

Kaplan and Strömberg (2009) propose a concept of financial engineering that refers to the disciplining effect brought by high leverage that is connected with the buyout transaction. According to Jensen's (1989) free cash flow theory that we discussed above, the use of leverage can efficiently suppress the management teams' behavior of wasting free cash and mitigate the conflicts between shareholders and management teams over the distribution of free cash flow, which is the central weakness and source of waste in public companies. With high leverage, the management must use free cash to pay interests and

principals rather than pursuing 'empire building'. Nevertheless, if the leverage of debt and equity is so high that it exceeds the company's debt capacity, the risk of financial distress will increase. Meanwhile, according to the entrepreneurship view (Wright et al. 2000a; Wright, et al. 2001), high leverage will limit managers' entrepreneurial behaviors in terms of investing in new ventures to spur the growth of their companies, as high leverage pursues high efficiency to create more cash flows and does not encourage investments in risky innovations.

Mixed empirical support for the disciplining effect of high leverage has been documented. For instance, Guo et al. (2011) observe that increased leverage causes a better cash flow performance. Achleitner et al. (2010) find the leverage effect is more important for larger buyouts in terms of value creation, compared to smaller buyouts. Interestingly, the results of Cotter and Peck (2001) demonstrate that the positive effect of debt on operating performance only exists under the condition of an absence of buyout specialists involved in the governance. In contrast, Nikoskelainen and Wright (2007) investigated 321 exited UK buyouts during the period from 1995 to 2004 and do not find strong evidence to support the impact of leverage on financial performance.

In addition, the increased value effect of high leverage could also be attributed to the high tax deduction of interests in many countries. These interest deductions may account for an important source of added value in target companies, especially for those paying huge amounts of tax before buyouts. Lowenstein (1985) claims that tax saving is an important explanation of value creation in buyouts, as it can be the main source of cash flow. Using a sample of 76 PTP MBOs between 1980 and 1986, Kaplan (1989b) finds that tax benefits could explain the companies' value. Depending on various assumed tax rates (15%, 30% and 46%) and the maturities of debt (permanent or 8 years), the tax deductions

can explain from about 5.7% to 56.2% on average. However, tax rates vary over years and countries, so it is very difficult to calculate the accurate value transferred from taxes (Kaplan and Strömberg, 2009).

1.6.2 Managerial ownership

As discussed above, the virtual issue of agency theory is the conflict of interests between shareholders and the management. Incentive alignment, however, is recognized as an effective mechanism to solve conflicts of interests. This can be achieved by increased managerial ownership, as in this way, managers are likely to be motivated to make meaningful and long-run investments on the behalf of shareholders. In the buyout context, enhancing incentive alignment through increasing fractional ownership of the management team appears especially popular. Without saying MBOs where management team hold the majority of ownership and become manager-owners, in other types of buyout, the managers either increase their ownership percentage through given shares and options (Jensen and Murphy, 1990) or are required by PE firms to invest money from their own pockets in the ownership to avoid their short-term investment (Kaplan and Strömberg, 2009). For instance, in his going private MBO sample, Kaplan (1989a) finds that the equity ownership of the management team increases from 5.88% to 22.63%. Recently, Kaplan and Strömberg (2009) document that the management team obtains 16 per cent of the equity after studying 43 US LBOs in the period from 1996 to 2004, consistent with the findings of Acharya et al. (2013).

Empirical studies provide strong evidence on the advantage of increased managerial ownership in terms of performance at company level. For instance, Kaplan (1989a) finds that management equity (improved incentive alignment) has a positive influence on post-buyout operating performance. Denis (1994) compares the destruction in ownership

structure and board composition between the LBO of Safeway Store and the leveraged recapitalization transaction of Kroger Co.. He finds the percentage of the management ownership in Safeway Store increases from 0.7% before the buyout to 10.3% after the buyout, against the 1.6 % increase of Kroger Co. from 1.4% prior to recap. Under the same circumstances of high leverage, increased management ownership, together with the close monitoring from LBOs, motivates managers of Safeway Store to improve more operational performance. Similarly, by using 214 US LBOs between 1986 and 1989, Phan and Hill (1995) find a notable increase in management equity ownership after buyouts and, as leverage, this increase leads to efficiency gains for the company, suggesting the elimination of the agency problem in the target companies by incentive alignment. These results are consistent with the earlier study conducted by Thompson et al. (1992). Recently, Bruton et al. (2002) find that increased managerial ownership results in superior operating performance after buyouts. Renneboog et al. (2007) have investigated 181 UK going private buyouts in the second buyout wave starting from 1997 and find that incentive realignment is crucial on increasing shareholder gains. Nikoskelainen and Wright (2007) find that management equity contributes to the enterprise value to some extent. However, they also suggest high management equity is associated with the negative performance. By contrast, Guo et al. (2011) do not find the contribution of higher management equity ownership to better operating performance.

Nevertheless, the literature also advances the critique that high levels of managerial ownership could cause entrenchment issues. Particularly in MBOs, the management team holds the majority ownership while PE firms become the minority shareholders. The incumbent management team may achieve their benefits at the expense of company's performance and other shareholders' benefits. In their theoretical study, Elitzur et al. (1998)

argue that managers who already hold large equity ownership before buyouts could increase their ownership fraction while reducing the money investment after buyouts. The results of their study suggest that increased monitoring from non-manager shareholders such as PE firms and increased money investment in the MBO from the incumbent management team will impact upon the effort that managers take on behalf of the company, and therefore, benefits the company's performance. Kaplan and Stein (1993) also support this conjecture by finding a negative relationship between the amount of the money invested by the management team in the MBOs and the probability of the financial distress of the target company.

1.6.3 Board of directors

It is recognized that corporate governance is about both monitoring managers to minimize downside risks to shareholders and enabling managers to use their expertise to achieve the benefits of upside potential of companies for shareholders (Uhlaner et al., 2007; Filatochev and Wright, 2005; Zahra et al., 2009). Correspondingly, the corporate governance literature advocates monitoring and advising as two most important functions of the board of directors (e.g. Guest, 2009; Raheja, 2005). The monitoring function stems from agency theory that suggests that companies and shareholders endow directors, especially outsiders, with the right and responsibility to monitor, discipline, and remove ineffective managers, to assure the wealth maximization of shareholders (Jensen and Meckling, 1976; Fama, 1980). The advisory function (or enterprising and service function as discussed in Uhlaner et al. (2007)) involves the directors (both inside directors and outside directors) bringing in valuable expertise and resources (Fama and Jensen, 1983; Guest, 2009).

However, in the previous corporate governance literature, the discussion on the

quality of board functions narrowly emphasizes the monitoring function from outsider shareholders because of the manifest agency issues between principal and agent in public companies.[7] Due to data limitations, there are much fewer studies on private companies. Indeed, on the one hand, while private companies may have agency issues, the focus of the boards should be shifted to its advisory function. In their theoretical discussion paper, Uhlaner et al. (2007) argue that the scope of corporate governance in privately held companies should go beyond the traditional agency theory focusing on large publicly listed companies. Rather, other theoretical perspectives (e.g. the knowledge-based view) that are relevant to the advisory function are more in demand to explain the more dynamic governance mechanisms in private companies. In their literature review work, Daily et al. (2002) also suggest the significant importance of the boards in entrepreneurial companies providing their companies with information, resources, or networks to promote the entrepreneurial companies' growth. One the other hand, private companies may have distinctive issues, such as principal-principal problem, relative to public companies and hence may have unique monitoring function. For instance, Garg (2013) argues that venture boards should have a distinctive monitoring function. In his theoretical framework, he argues that the monitoring function of venture boards depends on the characteristics of the ventures (e.g. the venture development stage) and the characteristics of directors (e.g. having founder as directors). As per the framework, especially, the personal characteristics of venture capitalist directors, such as professional obligation and personal ability/experience, executive considerable influence the board's monitoring function.

The literature usually treats the board of directors as a whole by measuring the board of directors as, for example, inside directors / outside directors ratio or board size.

[7] There is a huge literature discussing the board of directors in public companies, due to the focus of this thesis, we do not review these studies in detail.

Although there is one drawback of these measures, in that they encompass the quality of both monitoring and advisory functions, we still use these common measures in this thesis, not only because it is very difficult to collect data on directors' behavior, but also because the quality of the monitoring and advisory functions could be reflected in various elements of company's effectiveness (Uhlaner et al., 2007) in the forms of different performance measures.

1.6.3.1 Board size

Board size attracts much attention when investigating the efficiency of the board of directors. Although more outsiders can improve the monitoring and advisory functions of the boards, Jensen (1993) and Lipton and Lorsch (1992) suggest that small boards could be more effective than large boards. They argue that large boards could cause agency problems such as director free-riding within the board and the board becoming more symbolic and less a part of the management processes. Consistent with this view, the existing empirical evidence demonstrates a negative relationship between board size and companies' performance (Yermack, 1996; Eisenberg et al., 1998; O'Connell and Cramer, 2010). Jensen (1993) and Lipton and Lorsch (1992) even suggest an optimal board size of seven to nine directors. However, O'Connell and Cramer (2010) find that the negative relationship between board size and company performance is significantly less for smaller companies. Although buyouts tend to have smaller boards both when firms go private (Cotter and Peck, 2001; Cornelli and Karakas, 2013) or when they revert to public (Gertner and Kaplan, 1996), consistent with a move towards better corporate governance, the decreases are at the expense of replacing outsiders with insiders or reducing them to zero, especially in MBOs (Cornelli and Karakas, 2013). As a consequence, the monitoring and advisory functions may be weakened, due to the positive relationship between

company performance and percentage of outsiders (e.g. Cadbury, 1992; O'Connell and Cramer, 2010).

1.6.3.2 PE specialists on board

PE firms taking seats on the board is always viewed as a typical and high efficient mechanism of buyout organization to create value for both ultimate investors and target companies. Studies of boards in PE-backed buyouts have indicated that PE firms would appoint specialists to sit on the board (PE directors) (Rosenstein, 1988; Lerner, 1995; Fried et al, 1998; Gabrielsson and Huse, 2005; Cotter and Peck, 2001; Acharya et al., 2013; Cornelli and Karakas, 2013). The presence of PE specialists on the board may effectively monitor the company's executives to focus their efforts (e.g. Fried et al, 1998; Jenter and Kanaan, 2011) or provide valuable resources from their previous experience and network to complement the lack of inside managers (e.g. Politis and Landstrom, 2002). When the target companies have greater need for their expertise, the number of PE specialists on board will increase (Lerner, 1995; Rauch and Umber, 2012; Cornelli and Karakas, 2013). Via the impact of PE specialists, the board is more efficient and the company's performance can obtain improvement (Cornelli and Karakas, 2013).

Empirical evidence supports the importance of PE specialists as directors. For instance, Cotter and Peck (2001) analyzed a sample of 64 LBOs from 1984 to 1989 and found that buyout specialists (PE specialists) take more seats on the boards than other outside investors, suggesting the active monitoring of buyout specialists. Cornelli and Karakas (2013) find an increase in the fraction of PE specialists on the board when companies go private, by investigating 88 UK LBOs between 1998 and 2003. In addition, they find that PE specialists taking seats on the board can improve operating performance.

1.6.3.3 Independent outside directors

According to corporate governance recommendations and regulations, the independence of the board is essential for the effectiveness of the monitoring function of the board of directors. Independence should be measured by the fraction of independent outside directors, as suggested by Baysinger and Butler (1985). Empirical research provides support for the notion that boards dominated by independent outside directors are more effective than others (Byrd and Hickman, 1992).

Nevertheless, outside directors still could add more value to the enterprises by using their knowledge and wisdom from their previous experience (Keasey and Wright, 1993). [8] The function of outside directors, who offer advice to help decision-making strategy and ultimately improve performance, is more important in private companies than the monitoring function (e.g. Zarah et al. 2007; Lynall et al. 2003; Filatotchev and Wright, 2005). As Lerner (1995) states, independent outside directors are typically experts in the industry, academics, or entrepreneurs. The reason why they can take seats on the board in private companies is that their unique knowledge, expertise, and network resources are necessary for the companies. Furthermore, independent outside directors, per se, are motivated to offer advice in the area of their expertise to CEOs who will help enhance their status and reputation (Garg, 2013).

1.6.3.4 Inside directors' skills[9]

Fama and Jensen (1983) argue that because of their valuable internal information on the companies, inside directors are the most significant and irreplaceable directors on boards. This view is supported by recent theoretical and empirical studies (e.g. Raheja, 2005; Harris and Raviv, 2008; Adam and Ferreira, 2007; Masulis and Mobbs, 2011). They

[8] Obviously, PE-related directors are also one special component of outside directors.
[9] Inside directors are defined as full time employees of the company.

suggest or demonstrate that inside directors are valuable in improving the quality of boards' monitoring and advisory functions. In particular, high-quality or skilled inside directors are equipped with advanced board knowledge and skills, operational expertise, or broader resources and networks. Meanwhile, they are motivated to reveal internal information to the board and use their influential expertise to improve the boards' decision making.

Following Masulis and Mobbs (2011), we use inside directors' independent outside directorships as a proxy for skilled inside directors for two reasons. First, recent research finds evidence that supports the importance of the labor market for directors in identifying highly skilled managers (Brickley, Linck, and Coles, 1999; Fich, 2005; Fish and Shivdasani, 2007; Masulis and Mobbs, 2011). To retain their competitive advantage on the labor market, directors with outside appointments must continue to demonstrate their strong decision management skills, thereby increasing their attractiveness to their own board (Fama, 1980; Yermack, 2004; Masulis and Mobbs, 2011). The effort will result in company performance improvement. For instance, Masulis and Mobbs (2011) find that boards with inside directors that have outside directorships are more effective, resulting in better firm operating performance. Second, the outside directorship of these inside directors enhances their experience of the operating company and enables them to access more resources via expanding their network (Walsh, 1995). Outside directorship provides inside directors with a vehicle for learning both from their experience and from other directors (Useem, 1982; Carpenter and Westphal, 2001). Their enhanced skills help to enhance the effectiveness of boards' monitoring and advisory functions. As a consequence, it is more likely to increase the company's performance and the possibility of exploiting growth opportunity of their home companies.

1.6.3.5 The effect of top management (CEO/CFO)

One of the most important tasks of the board is to monitor and choose an appropriate CEO (e.g., Mace, 1986). This is because the CEO's ability, preferences, and decisions impact company performance (Bertrand, 2009; Bertrand and Schoar, 2003). If a CEO performs poorly, for instance by entrenching himself in his positions, the company would underperform (Bebchuk et al., 2009). Studies find companies with poor performance tend to replace their CEO (Hermalin and Weisback, 2001). After changing CEO, performance generally improves because of the strategic changes and right decisions (e.g. Weisbach, 1995; Denis and Denis, 1995).

The buyout literature also highlights the importance of replacing the top management (e.g. Kaplan, 1989a; Smith, 1990; Acharya et al., 2013; Gong and Wu, 2011; Cornelli and Karakas, 2013). For instance, Acharya et al. (2011) find that over one third of deals change CEOs/CFOs within 100 days after the transactions, and PE firms have intensive interaction with CEOs/ CFOs through formal and informal channels. These intensive engagements of PE firms are associated with performance improvement. Gong and Wu (2011) use 126 US LBO deals from 1990 to 2006 to investigate CEO turnover in PE-backed LBOs. Their findings demonstrate that 51 per cent CEOs are replaced within two years of buyout announcements. CEO replacement is positively related to high agency costs, measured as high level of undistributed free cash flow and low leverage, and low pre-buyout operating performance, measured as return on assets. Cornelli and Karakas (2013) find that the board representation of PE specialists reduces the probability of CEO replacement and the relationship between CEO turnover and pre-buyout performance is weak. These two findings suggest the rationality of PE sponsors when they make a decision to change a CEO. They also find that CEO turnover can improve operating

performance, in accordance with the hypothesis that buyouts have superior corporate governance. In their working paper, Rauch and Umber (2012) use 211 German PE investments from 1997 to 2009 to investigate the variety of activism of PE firms. They classify PE holding control shares and/or taking seats on the boards and/or changing CEO/CFO as active behavior, and other forms of behaviors as passive behavior. They find 50% of buyout deals are active; equal to the number of passive buyouts. Notably, the buyouts backed by active PE firms have better operating and financial performance that those backed by passive PE firms. Although they do not mainly focus on the impact of corporate governance on operating performance, Guo et al. (2011) provide evidence that operating performance is higher for buyouts where the CEO was replaced.

1.7 PE firms and performance

1.7.1 The impact of PE backing on performance

Theoretically, in order to maximize their own value and maintain the reputation of the PE firms, PE specialists have motivations to execute influence on the operating performance of the investee companies. As a consequence, PE-backed companies would have better performance than non-PE-backed companies. [10] However, the empirical evidence is mixed. For instance, rather than the evidence discussed in section 1.3.2, Jain and Kini (1995) investigate the post-IPO operating performance of VC-backed IPOs, with a sample of 136 VC-backed IPOs. Their results demonstrate that VC-backed IPOs show better operating performance after IPO, relative to a control sample of non-VC-backed IPOs. Moreover, this superior performance continues to exist when control for other operating performance factors. Using a sample of 934 VC-backed IPOs in the US from 1972 to 1992, Brav and Gompers (1997) show that VC-backed IPOs have higher equal-

[10] Some studies on buyouts treat PE-backed deals and buyouts as the same thing (e.g. Kaplan, 1989; Smith, 1990; Cressy et al., 2007; Metrick and Yasuda, 2011). Thus, we do not repeat to review these studies.

weighted returns than non-VC-backed IPOs. Jelic et al. (2005) examine the role of VC in the financial performance of PTP MBOs by using 167 UK MBOs exiting through IPOs. They find that VC-backed MBOs have superior financial performance to that of their non-VC-backed MBO peers. But this outperformance disappears in the long run. Levis (2011) compares the performance between PE-backed IPOs and non-PE-backed IPOs from 1992 to 2005, and find that PE-backed IPOs perform better in both market and operating performance in the three years after IPOs. By contrast, after investigating VC-backed IPOs in Germany, the UK, and France, Rindermann (2004) concludes that VC-backed IPOs do not generally generate superior market performance compared to non-VC-backed buyouts. But they find that internationally operating venture capitalists do boost the market performance of their backing companies, suggesting the importance of the heterogeneity of VC. Jelic et al. (2012) only demonstrate PE-backed MBOs outperform their counterparts in employment performance in the long run. They do not find convincing results of superior performance of PE-backed MBOs with other operating performance measures.

1.7.2 Agency problem between limited partners and general partners

Nevertheless, just as with public companies, **t**he organizational structure of PE firms might create a new form of principal-agent problem whereby the agent (the general partner) can make investment decision on his own behalf instead of maximizing principal's (the limited partner) benefit.

According to the argument of Arcot et al. (2014), there are two factors which induce a conflict of interests between general partners and limited partners. First, in order to show his deal activity, the general partner has an incentive to engage in more deals even though these deals might not be the best investments. This is because the principal (the limited

partners) cannot distinguish ‘actively doing nothing’ from ‘simply doing nothing’ (Dow and Gorton, 1997). If the general partner chooses to hold the committed capital when he cannot diligently identify an optimal investment opportunity, he would be treated as incompetent agent and loses the limited partner’s investment in the subsequent fund. Second, the general partner is tempted to overinvest, as the fixed fees of the general partner are positively correlated to net invested capital (Metrick and Yasuda, 2011). For instance, some funds may calculate the fixed fees as a constant rate on a changing basis from committed capital to net invested capital. Hence, PE fund managers may be under pressure to invest more deals without considering the optimal investment strategy.

Axelson et al. (2009) and Axelson et al. (2013) also state that the agency conflicts between general partners and limited partners will lead to general partners increasing the leverage when they invest in buyouts and misjudging the quality of the investments. In particular, because of the limited liability and the profit-based carry interests, general partners have motivation to overinvest and/or invest in bad deals. First, if the general partners raise funds on a deal-by-deal base, general partners will increase the leverage and invest as many as possible when the debt is cheap, as in Axelson et al. (2009). They will overpay for the deal at the expense of limited partners, as this high leverage will cause lower fund returns (Axelson et al. 2013). Second, if general partners can raise funds for a number of future deals, they might ‘go for broke’ and invest in bad deals (Axelson et al., 2009). This argument is consistent with the first argument of Arcot et al. (2014) that when the fund is approaching to the end of its life and there are not enough good deals available, general partners are prone to choose bad deals.

1.7.3 Competitive advantages of PE firms and performance

PE firms apply their competitive advantages (the heterogeneity of PE firms’

characteristics) to achieve successful transactions and assist the operational improvement of target companies to create value. In order to accommodate the growing completion in PE industry, PE firms have to pursue their competitive advantages. The competitive advantages of PE firms are built upon abundant previous investment experience, the number of investments per executive, the investment strategies of PE firms, and their industry and operating expertise. Herein, we summarize some selected studies in Table 1.4.

Insert Table 1.4 about here

With respect to previous experience, Meuleman et al. (2009) conclude that first, the depth and breadth of previous investment experience enable PE firms to reduce the adverse selection problem caused by information asymmetry when selecting the deals. First, more experienced PE firms are more likely to be able to identify deals with better performance or better value creation potentials. Second, PE firms with abundant experience can be more efficient at eliminating the moral hazard problem caused by the incumbent's management of target companies and help to create value, because they can provide better monitoring to improve management efficiency. Third, more experience equips PE firms with expertise and competencies relevant to strategy making, operational management, human capital resources (e.g. sophisticated managers), extensive network (e.g. suppliers, customers, investors), merger and acquisition skills, etcetera. These kinds of expertise and competencies might supplement the knowledge and skills possessed by the incumbent management team, leading to a better operational system and more growth opportunities. For instance, using a sample of 238 PE-backed UK buyouts in the period of 1993 to 2003, Meuleman et al. (2009) investigate the determinants of profitability, efficiency and growth from a strategic entrepreneurship view. They find more PE firms experience is related to higher growth performance at the target company while not related

to better performance in profitability and efficiency. This suggests that PE firms with more experience can exploit more growth opportunities to improve performance. In their paper examining the investment performance effect of the knowledge derived from previous investment experience, De Clercq and Dimov (2008) measure the investment performance as the exit outcomes of VC firms. They classify knowledge into internal knowledge, which is from investments in a particular industry, and external knowledge that is associated with the number of syndicate partners in one investment and the number of prior interactions with the partners in a particular investment. They find that greater industry knowledge for relevant investments, more syndicate partners or more VC firms co-investing, and more previous interactions with the syndicate partners for a certain investment generate better investments' performance, for example, with going public and acquisitions. In particular, the performance effect of external knowledge could be moderated by the effect of internal knowledge when considering their joint effect. Their findings suggest that VC firms can obtain a competitive advantage from both internal and external knowledge to gain better investment performance. Despite not studying the operating performance of target companies, Gomper et al. (2008) also confirm that industry experience is more important than general experience in leading to successful deals measured by the probability of profitable exits such as going public and merger or acquisition, on the basis of a dataset of 13,785 companies in which 1,084 VC firms invested from 1975 to 1998. This finding suggests the importance of industry-specific knowledge to identify good deals and know-how to manage and create value for these deals.

With regards to the number of investments per executive, studies (e.g. Elango et al., 1995; Meuleman et al., 2009) also argue that the number of investments managed by one executive, which indicates the intensity of monitoring, affects the value creation of PE

firms. This is because increasing the number of investments per executive will cause decreases in the allocation of time and the advice that the executive can provide to one investment, which is more likely to lead to the failure of investment. For instance, Meuleman et al. (2009) find that the number of investments per executive has a significant and negative relationship with profitability and growth performance. As a control variable, Cumming and Johan (2007) find that VC managers with a large number of investments under management tend to make less effort (for instance, less support and less advice) in the development of their investments.

Indeed, PE firms tend to organize their investments around specific industries and stages of development to aggregate the industry and stage experience and expertise (e.g. Elango et al., 1995; Cressy et al., 2007; Manigart et al., 2002). The heterogeneity in industries and stages of development means the heterogeneity in operational strategies in business. Similar to previous experience, the specialization investment strategies also enable PE firms to reduce the information asymmetry and uncertainty, as they learn more and acquire deeper knowledge on that industry or stage and understand the best way of value creation for their investments (Cressy et al., 2007). Cressy et al. (2007) constructed a sample of 122 UK buyouts from 1995 to 2002 to examine the influence of industry and buyout/acquisition stage specializations on post-buyout operating performance. They adopt dummy variables to proxy for industry and buyout/acquisition stage specializations based on the fraction of investments by PE firms in a particular industry and stage. They find that industry specialization contributes between 6% and 8.5% to the operating profitability of target companies over the first three years after buyouts, suggesting that PE firms specialized in certain industries do improve the target company. However, they do not find convincing evidence on the positive effect of buyout/ acquisition stage

specialization on post-buyout operating performance, but it improves growth performance to some extent. In their literature review study, Siegel et al. (2011) argue that the effects of PE funds on the post-investment performance of their portfolio companies are closely related to the prior experience and specialist sector expertise of funds' managers.

In addition, unlike PE firms in the 1980s and early 1990s that are characterized by employing professionals from an investment banking background, PE firms nowadays are more likely to hire professionals with operating and industry skills and experience (Kaplan and Strömberg, 2009). The industry and operating expertise of these professionals assists their investment strategies and plays a core role in their competitive advantages. Thus, PE specialists use their aggregated operating and industry/stage experience, knowledge, and skills to identify attractive deals, develop strategies and operational and financial management for the target companies, and improve their operating performance (*ibid*). Although analyzing the PE fund performance, Kaplan and Schoar (2005) conjecture that the skills and quality of GPs (human capital as they described) could be crucial drivers of fund performance. Cumming et al. (2007) also highlight the necessity of understanding the human capital, especially the product and operations expertise of PE firms. Inspired by them, Acharya et al. (2013) provide evidence on the importance of the deal partners' professional background on target companies' performance on the basis of interview data. They find that deal partners with previous operational and industrial experience are associated with high level of governance intervention. In the subsample of 'organic' deals that improve performance internally, deal partners with strong operational and industrial background generate more performance than others through active governance intervention. In contrast, deals partners with a financial background are more likely to achieve success by using merger and acquisition to generate value. In line with these

results, Bottazzi et al. (2008) investigate the influence of human capital of VC firms on the investments' success via using 119 European VC deals. Their results show that VC specialists with previous business experience appear to be more active in the companies in which they invest than those who have more venture investment experience. They will actively engage in recruiting senior managers and outside directors, helping target companies to get additional financing, and high frequency of interaction with the target companies. As a consequence, this active involvement is more likely to lead to successful exits defined as IPO and acquisitions.

1.8 Conclusion

The literature review on SMBOs shows that researchers have mainly concentrated on the motivations for SMBO. Some studies (please see Panel B of Table 1.2) consider the post-SMBO operating performance, but there has been no conclusive empirical evidence. Table 1.2 (Panel B) also shows that the analysis of the determinants of post-SMBO operating performance is scant. In terms of theory and empirical evidence, the post-SMBO operating performance still puzzles academic researchers. We extended the literature by exploring post-SMBO operating performance more comprehensively, more specifically, by relating post-SMBO operating performance to agency theory and strategic entrepreneurship perspective, corporate governance, and PE firms.

With regard to the operating performance of SMBOs, our literature review reveals the following gaps. First, traditional theoretical literature suggests that buyouts improve companies' performance by eliminating agency problems (Jensen, 1989), but the empirical results on this are mixed. Studies listed in Table 1.1 show that, although US and UK evidence in the first wave of buyouts supports Jensen's agency theory, recent studies on the second buyout wave and in different European countries fail to draw a conclusion on the

outperformance of buyout organizations. This suggests that the traditional agency theory cannot effectively explain buyouts' performance in a broader environment. Hence, the strategic entrepreneurship perspective is introduced to buyout literature to supplement Jensen's (1989) agency theory. However, current SMBO studies tend to examine efficiency gains through the lens of agency theory and ignore the growth performance explained by the strategic entrepreneurship perspective. Moreover, although these studies cover the recent SMBO wave, the sample size of UK SMBOs is quite small, with the largest sample being 195 UK SMBOs from 2000 to 2007 (Jenkinson and Sousa, 2013), due to the data limitations of the databases they adopt. In fact, according to the SMBO coverage in CMBOR, which is the most comprehensive database on UK buyouts, there were 612 UK SMBOs between2000 and 2007. Thus, the sample size of UK SMBOs in the extant studies only accounts for 31.9% of total UK SMBOs. In addition, the definition of SMBO in all these studies, except for Jelic and Wright (2011), is PE firm to PE firm transaction.[11] However, as not all buyouts are PE-backed deals, the analysis of SMBOs should also include other types of deals such as management team to PE firm deals,[12] management team to management team deals, and PE firm to management team deals. We attempt to fill these gaps by investigating long term post-SMBO performance in terms of profitability, productivity, employment growth, and sales growth. More comprehensive data is provided in chapter 2.

Sections 1.6.1 and 1.6.2 of the literature review conclude that, despite some mixed evidence, the two main mechanisms for value creation in buyouts are high leverage and the alignment of management incentive with management ownership. They effectively reduce agency problem and enhance the management efficiency, thereby improving the target

[11] Both sellers and buyers are PE firms.
[12] Sellers are managers while buyers are PE firms. The other two types have similar patterns.

companies' performance. On the other hand, excessive leverage and managerial ownership can also reduce company performance. Given that SMBOs involve higher leverage and managerial ownership than primary buyouts, skeptics about SMBOs suggest that the effect of superior value creation mechanisms of buyouts would reduce in the secondary round and ultimately have no potential to improve performance. However, apart from Smit and Volosovych (2013), none of these studies empirically support the skeptics' view by directly examining the relationship between the two typical value creation mechanisms and post-SMBO operating performance. Hence, chapter 2 also examines the impact of leverage and managerial ownership on post-SMBO operating performance.

The literature on the board of directors reviewed in section 1.6.3 suggests that PE firms tend to actively interact with the board of directors, such as taking seats on board or replacing the top managers (CEO/CFO), in order to more closely monitor managers and enhance the management efficiency. Some studies provide evidence that these active interactions between PE firms and boards can reduce agency problems and bring better operating performance to buyouts. However, research about whether these mechanisms will still exercise influence at the secondary round is scarce. Furthermore, the general literature about company boards argues that the effect of the board of directors on the operational process should not be restricted to its monitoring function to improve the downside efficiency, but rather, its advisory function to boost the upside growth should be more important in private companies. Nevertheless, due to data limitations concerning private companies, none of these studies empirically investigate whether the advisory function of the board of directors can improve the upside growth in buyouts, not to speak of SMBOs. We fill this gap in literature in chapter 3 by examining the changes in board rooms after

SMBO transactions and whether these changes influence post-SMBO operating performance in terms of downside efficiency and upside growth.

The review of literature in section 1.7 reveals the importance of PE firms in relation to the performance of buyouts. Firstly, PE firms might chase their own benefits while ignoring those of the limited partners. It is possible that, under the fund pressures, selling PE firms exit good deals and the buying PE firms purchase bad deals. Secondly, the different competitive advantages of PE firms which bring in various resources and experience can determinate the operating performance improvement in the secondary round. The results of more recent studies testify that PE firm's competitive advantages (or the characteristics of PE firms), such as previous experience, specification, and the human capital, contribute to the portfolio companies' operating performance. Nevertheless, current SMBO studies on these two perspectives only examine their impact on investment returns at fund level (e.g. Degeorge et al., 2013; Arcot et al., 2014). Only Jenkinson and Sousa (2013) focus on the company level, but they only examine the impact of the selling and buying PE firms' previous experience on efficiency gains (profits and profitability), whereas the competitive advantages of PE firms are multidimensional, with influence on both efficiency gains and growth performance. Therefore, we fill this gap in chapter 4 through comprehensively exploring the determinants of post-SMBO operating performance from PE firms' perspectives, in order to understand both the selling and buying PE firms' behaviour when they invest in SMBOs.

Table 1.1: Selected studies on post-buyout operating performance

Authors	Country	Period	Sample	Findings
Kaplan (1989a)	US	1980-1986	76 PE-backed PTP buyouts	Increases in operating income /assets (sales) by 7.1%-36.1%; decreases in capital expenditures / assets (sales) by 4.4% - 31.6%; increases in net cash flow / assets (sales) by 28.3% - 85.4% after buyouts
Smith (1990)	US	1977-1986	58 PE-backed PTP MBOs	Increases in operating cash flows / operating assets (the number of employees). Tightened working capital but not layoffs and reductions in capital expenditures contribute to the increases.
Opler (1992)	US	1985-1989	44 PTP LBOs	11.6% increase in industry adjusted operating profits /sales and 40.3% increase in industry adjusted operating profit / the number of employees after buyouts. Decreases in capital expenditure, paid income tax and research and development expenditure.
Wright et al. (1992)	UK	1980s	182 MBOs and MBIs	68% of sample MBOs and MBIs experience increases in profitability after transactions.
Wright et al. (1996)	UK	Mid-1980s	409 MBOs	MBOs show increases in return /assets and profit / the number of employees in the third to fifth post-buyout years, compared to non-MBOs.
Cressy et al. (2007)	UK	1995-2002	122 PE-backed buyouts	PE-backed buyouts have 4.3% and 6.97% higher operating profitability and turnover growth than controlled non-buyouts companies, respectively.
Amess and Wright (2007)	UK	1993-2004	533 LBOs	MBO companies have higher employment growth performance than non-buyout companies.
Bergstrom et al. (2007)	Sweden	1999-2001	69 Buyouts	EBITDA margin, return on invested capital, and sales growth increase by 3.07%, 17.38%, and 3.45% after transactions, individually.
Acharya et al. (2013)	Western Europe	1991-2007	395 PE-backed LBOs and MBOs	Sample companies experience increases in operating performance measured by sales, profitability, and EBITDA multiple during PE (buyout) ownership.
Boucly et al. (2011)	France	1994-2004	839 LBOs	Buyout companies have better performance in profitability and growth than matched non-buyout companies.
Guo et al. (2011)	US	1990 - 2005	94 PTP LBOs	Significant improvements in EBITDA/ sales and net cash flow / sales are only observed when using industry, previous performance, and market-to-book adjusted benchmark to estimate the changes in performance from pre- to post- buyouts. However, the magnitudes of these increases are much smaller than those of Kaplan (1989a). Furthermore, traditional unadjusted and industry-adjusted benchmarks do not demonstrate significant performance improvement.
Desbrières and Schatt (2002)	France	1988-1994	110 Buyouts	Sample buyout companies show decreases in return/equity, return/ investments, and margin ratios (EBIT/Sales, Net profit/Sales, and Cash flow/Sales) in the first two years after transactions, related to matched industry peers.
Jelic and Wright (2011)	UK	1980 - 2004	1,225 MBOs	No significant improvements in leverage and operating efficiency after transactions. Sample companies show significant increases in profitability and employment up to three post-buyout years, significant increases in output up to five post-buyout years, and significant decreases in dividend payments up to five post-buyout years.
Weir et al. (2008)	UK	1998-2004	112 PTP buyouts	Compared to the industry matched peers, sample buyout companies obtain significant improvement in return on capital equity while significant deterioration in return on capital equity and EBITDA to total assets after transactions.

Table 1.2: Selected studies on SMBOs' motivations and performance

Panel A: Motivations

Authors	Country	Period	Sample	Hypotheses	Findings
Wright et al. (2000b)	UK	1984 -1997	229 SMBOs/BIs	Enterprise hypothesis; Incumbent management team hypothesis	Accepting enterprise hypothesis to some extent; Accepting incumbent management team hypothesis.
Kitzmann and Schiereck (2009)	Worldwide	1999-2004	-	Pecking order hypothesis	Rejecting pecking order hypothesis.
Wang (2012)	UK	1997-2008	485 SMBOs	Efficiency gains hypothesis (value creation hypothesis); Market condition hypothesis; Collusion hypothesis	Accepting market condition hypothesis.
Achleitner et al. (2012a)	North America and Europe	1995-2008	1,112 exited LBOs (340 SMBOs)	Pecking order hypothesis; Market condition hypothesis; Debt capacity hypothesis; Fund pressure hypothesis	Accepting market condition hypothesis, debt capacity hypothesis, and fund pressure hypothesis.
Bonini (2013)	Europe	1998-2008	2,911LBOs, vs. 163 SMBOs (about 90 UK SMBOs)	Value creation hypothesis; Mispricing hypothesis (market condition hypothesis); Collusion hypothesis	Accepting mispricing hypothesis.
Jenkinson and Sousa (2014)	Europe	2000-2007	759 PE exiting deals	Specializations hypothesis (value creation hypothesis); Pecking order hypothesis; Market condition hypothesis; Fund pressure hypothesis	Accepting market condition hypothesis and fund pressure hypothesis.
Arcot et al. (2014)	Worldwide	1980-2010	9,771 LBOs (1,274 SMBOs)	Fund pressure hypothesis	Accepting fund pressure hypothesis.

Panel B: Empirical studies on post-SMBO operating performance

Authors	Country	Period	Sample	SMBO sources	Performance measures	Abnormal performance measure methods	Relevant determinants of post-SMBO performance	Models for determinants	Findings
Bonini (2013)	Europe	1998-2008	2,911LBOs, vs. 163 SMBOs (about 90 UK SMBOs)	Mergermarket, S&P LCD	Operating margin ratios, turnover ratios, return on Investment ratios, Return on equity ratios, Liquidity ratios, Capital structure ratio	Yearly performance changes, two years window (compared with one year prior SMBOs)	-	-	Compared to the significant and great improvement of operating performance in primary buyouts, operating performance in secondary round experiences considerably smaller and/or even not significant improvement.
Achleitner and Figge (2014)	Worldwide	1990-2010	2,456 realized buyout transaction with 448 SMBOs (99 UK SMBOs)	Databases complied by three European funds of funds	EBITDA growth, sales growth, and changes in EBITDA margin (measured as EBITDA/sales)	OLS; Heckman two steps regression,	-	-	No convincing evidence exhibits that post-SMBO performance is significantly different from the post-buyout performance of other types of buyouts.
Wang (2012)	UK	1997-2008	140 SMBOs vs. 465 first-time buyouts	Zephyr	Target's size (fixed assets and sales), operating cash flow(EBITDA, EBITDA/sales, EBITDA/fixed assets) , profitability (Earnings/sales, ROA)	Yearly performance changes, three-year window (compared with one year prior SMBOs)	-	-	Significant increase in fixed assets, sales, and profits (EBITDA), but firms' profitability and EBITDA/ sales decreases. Thus, SMBOs do not improve operating efficiency gains.
Smit and Volosovych (2013)	UK	1999-2008	101 SMBOs	Thomson one banker and SDC Platinum	Profitability (ROS and ROA)	Performance changes, From -1 the last year befo exit	Pre-SMBO performance, Management equity participant, CEO replacement, club PE participants, PE reputation, Sponsor directors/ board size, Bank loans/ Total debt, Entry leverage, leverage change	OLS	Significant reductions in profitability; Pre-SMBO performance, positive leverage change and CEO replacement can improve post-SMBO operating performance

(Continued)									
Jelic and Wright (2011)	UK	1980-2004	1,125 MBOs (about 94 SMBOs)	Various databases (e.g. CMBOR, Quarterly Reviews, KPMG MBO commentaries)	Profitability, sales efficiency, Output (Sales), Dividends, Total employment, and Leverage	Yearly performance changes, five-year window (compared with the median value of performance over three years prior SMBOs	PE backing	GLS random-effects model corrected for selection bias	Significantly increases in output, sales efficiency, and dividend, while significant decreases in leverage and profitability. PE backing does not have significant impact on post-SMBO performance.
Jenkinson and Sousa (2013)	UK	2000-2007	194 SMBO exits vs. 114 IPO exits	Captical IQ and Private Equity Insight	Total assets, total sales, EBITDA, and net cash flow	Yearly performance changes, three-year window (compared with one year prior SMBOs)	Previous deal holding period, selling and Purchasing PE firms' experience	OLS	Targets exited through SMBOs underperform those exited through IPOs; This underperformance could be partially explained by the previous holding period and the purchasing PE firms' experience.
Achleitner et al.(2012b)	-	-	The case of Brenntage backed by BC partner	private source	Gross profits, EBITDA growth, Sales growth, EBITDA margin, and capital expenditure	Average annual values over the holding periods	-	-	SMBOs can achieve further operational performance improvement which is reflected in EBITDA growth, sales growth, and EBITDA margin.

Table 1.3: Selected empirical studies on corporate governance of buyouts

Panel A: Leverage

Authors	**Country**	**Period**	**Sample**	**Findings**
Cotter and Peck (2001)	US	1984-1989	64 LBOs	Debt has positive effect on post-buyout operating performance of deals without buyout specialists on the board.
Nikoskelainen and Wright (2007)	UK	1995-2004	321 existed UK buyouts	Debt coverage only has weak influence on LBO returns.
Achleitner et al. (2010)	Europe	1991-2005	206 buyouts	For larger buyouts, leverage effect on value creation is more important compared to smaller buyouts.
Guo et al. (2011)	US	1990 - 2005	94 PTP LBOs	Higher debt leads to better cash flow performance

Panel B: Managerial ownership

Authors	Country	Period	Sample	Findings
Thompson et al. (1992)	UK	1982-1989	31MBOs	Higher managerial equity after transaction is associated with higher post-buyout performance.
Denis (1994)	-	Mid-1980s	Case study (1 LBO vs. 1 leveraged recapitalization transaction)	Managerial ownership increases after transactions. Increased managerial ownership in LBO, together with board monitoring, enhances manager's motivation to improve operating performance.
Phan and Hill (1995)	US	1986-1989	214 LBOs	Increased managerial ownership improves the efficiency gains.
Bruton et al. (2002)	US	1980-1988	39 buyouts	Increased managerial ownership has positive effect on post-buyout operating performance.
Renneboog et al. (2007)	UK	1997-2003	181 PTP buyouts	Incentive realignment contributes to shareholders' returns.
Nikoskelainen and Wright (2007)	UK	1995-2004	321 existed UK buyouts	For large buyouts and successful buyouts, managerial ownership is an important determinant of enterprise value.
Acharya et al. (2013)	Western Europe	1991-2007	395 PE-backed LBOs and MBOs	
Guo et al. (2011)	US	1990 - 2005	94 PTP LBOs	Buyouts with higher level managerial ownership do not have superior operating performance.

Panel C: Board of directors

Authors	Country	Period	Sample	Findings
Cotter and Peck (2001)	US	1984-1989	64 LBOs	Buyouts have a smaller board size. Buyout specialists take more seats on the boards in smaller boards.
Gong and Wu (2010)	US	1990-2006	126 LBOs	51 % CEOs are changed within two years after transactions. Buyouts with higher pre-buyout agency costs and lowers pre-buyout operating performance are more likely to change CEOs.
Acharya et al. (2013)	Western Europe	1991-2007	395 PE-backed LBOs and MBOs	2/3 sample buyouts replace CEOs/CFOs within 100 days after transaction. PE firms intensively interact with CEOs/CFOs.
Guo et al. (2011)	US	1990 - 2005	94 PTP LBOs	Replacing CEO improves cash flow performance.
Cornelli and Karakas (2013)	UK	1998-2003	88 PTP LBOs	After transactions, board size decreases and the fraction of PE specialists on the board increase. Higher fraction of PE specialist directors leads to lower possibility of CEO turnovers. CEO turnover and high fraction of PE specialists directors improve post-buyout operating performance.
Rauch and Umber (2012)	Germany	1997-2009	211 PE investments	50% of sample PE investments are backed active PE firms. Active PE firms have positive effect on their target companies operating and financial performance.

Table 1.4: Selected studies on competitive advantages of PE firms and performance

Authors	Country	Period	Sample	Variables (PE firms' competitive advantages)	Findings
Meuleman et al. (2009)	UK	1993-2003	238 PE-backed UK buyouts	PE experience, Investments/executive	PE experience has a positive relationship with growth performance but not profitability and efficiency. Investments/executive is negatively correlated to profitability and growth.
De Clercq and Dimov (2007)	US	1962-2002	547 VC firms	Internal knowledge measured by previous industry knowledge, external knowledge measured by number of syndicate partners and number of prior integrations	More previous industry knowledge and cooperating with more or familiar other VC firms improve the investments' performance (e.g. going public and acquisitions). External knowledge and internal knowledge complement each other.
Cressy et al. (2007)	UK	1995-2002	122 PE-backed buyouts	Industry specialization, stage(buyout) specialization	Industry specialization brings in 6%-8.5% to operating profitability. Stage (buyout) specialization only improves growth performance to some extent.
Gomper et al. (2008)	Worldwide	1975-1998	1,084 VC firms (13,785 invested companies)	Overall experience, industry experience, industry specialization	VC firms with more overall experience and industry experience, but not industry specialized experience are more likely to exit their investments through IPOs or merger/acquisition. However, industry-specific experience is more important than overall experience in indentifying good opportunities.
Acharya et al. (2013)	Western Europe	1991-2007	395 PE-backed LBOs and MBOs	Operational and industrial background, financial background	With regard to the way of improving performance, general partners with operational and industrial background have greater degree of governance intervene while those with financial background outperform with merger and acquisition events.
Bottazzi et al. (2008)	European	1998-2001	119 VC deals	Venture experience, business experience, science education	Compared to venture experience and science education, general partners with business experience are more active in their portfolios with more successful investments.

CHAPTER 2

SMBOS: BUYING TIME OR IMPROVING PERFORMANCE?[13]

2.1 Introduction

The debate on the post-SMBO operating performance of the target companies has attracted much attention from scholars in PE and buyout areas. For instance, Wright et al. (2009b) suggest that the value creation mechanisms have already existed in primary buyouts, resulting in difficulties of obtaining further value creation for the following buyout investors. Under these circumstances, a significant improvement in operating performance for target companies might not be possible in SMBOs (Jelic and Wright, 2011). One the other hand, operating performance improvement of target companies may still be possible. For instance, some PE firms from initial rounds may be forced to exit early due to the fund expiry (Achleitner and Figge, 2014; Jenkinson and Sousa, 2014). Moreover, second round PE firms could create value by adopting new strategies or by changing existing practices.

Recent emerging research on SMBOs reposts mixed evidence in terms of post-SMBO operating performance. For example, Achleitner and Figge (2014) put forward the argument that (worldwide) SMBOs are not different from other types of buyouts in terms of operating performance. However, the study of Bonini (2013) reposts no significant performance improvement after European SMBOs. With regards to UK data, Wang (2012) finds that SMBOs outperform primary buyouts in creating cash flows but underperform in creating earnings. Also, Jelic and Wright (2011) demonstrate significant outperformance in terms of output and dividends, but significant underperformance in terms of gearing and profitability in the post-SMBO phase.

[13] Parts of this chapter were published in Zhou et al. (2014).

However, recent research only focuses on operating performance, in terms of efficiency gains such as profitability, in the first three years after SMBO (Bonini, 2013; Wang, 2012; Achleitner and Figge, 2014) and the operating performance in long run during the period of early 2000s (Jelic and Wright, 2011). Growth however is a highly recommended measure in the strategic entrepreneurship literature. More specifically, traditional agency theory tends to highlight the reduction of costs caused by over-investment and over-diversification, while ignoring the strategic entrepreneurship dimension. The strategic entrepreneurship perspective claims that, in the buyout context, managers and PE firms have a strong incentive to utilize their idiosyncratic knowledge, skills, experience, and capabilities to exploit growth opportunities and create wealth (Wright et al., 2000b; Meuleman et al., 2009, Zhou et al., 2013).

Furthermore, previous studies have found evidence that value creation mechanisms, including managerial ownership, high leverage (debt bonding), and governance intervention on the boards, drive the post-buyout performance (Rauch and Umber, 2012; Cornelli and Karakas, 2013; Nikoskelainen and Wright, 2007; Guo et al., 2011). The prolongation of the longevity of the buyout structure caused by SMBOs may change the explanatory powers of these value creation mechanisms (Wright et al., 2009b). Nevertheless, evidence on both the growth performance of target companies and the determinants (value creation mechanisms) of the performance is scarce. This paper aims to fill this gap by further examining whether SMBOs just buy time or improve the performance of target companies.

Based on a hand-collected dataset of 491 UK SMBOs from 2000 to 2007 and their exit statuses and post-SMBO performance, we firstly examine whether the target companies' operating performance achieved improvements after SMBO transactions. More specifically, we examine the target companies' post-SMBO performance in regard to

profitability, productivity, and growth. We also compare the performance of PE-backed SMBOs with that of non-PE-backed SMBOs. Secondly, we analyze whether value creation mechanisms associated with the PE model and buyouts, such as high leverage and managerial ownership, still have the power to explain changes in performance after SMBOs.

The rest of this chapter is structured as follows. Section 2.2 develops testable hypotheses. Section 2.3 presents the data description and main methodology. Section 2.4 discusses the results of univariate and regression analyses. In section 2.5, we check for the results' robustness, followed by section 2.6 which is the conclusion.

2.2 Hypotheses development

2.2.1 Post-SMBO performance

2.2.1.1 SMBOs buy time?

Before SMBOs, the governance mechanisms (managerial ownership, governance intervention, and high leverage) had already existed in the companies (Wright et al., 2009b). The effects of these mechanisms are likely to last for 2-3 years after buyout (Wiersema and Liebeskind, 1995). After this period, the effects on the performance seem to decline (Jelic and Wright, 2011). Moreover, PE firms normally exit when the marginal value added is less than the marginal costs (Cumming and MacIntosh, 2003). In other words, when exiting, their skill set is exhausted and no further value creation can be achieved. The going public and trade sale would be the first choices for exits, as they could enhance the reputation of the PE firms (Schwienbacher, 2002). When a going public and a trade sale are not available, a SMBO may be one of the few options left. In addition, management investments in the SMBOs are usually greater than primary buyouts (Achleitner and Figge, 2014). Although increased managerial equity shares may lead to a greater incentive, it may also induce

greater entrenchment behavior. Based on the above arguments, it is impossible for SMBOs to obtain performance improvement. They are, therefore, just used as means to buy more time before IPO or trade sale exits.

Hypothesis 1: SMBOs underperform in post-SMBO period.

2.2.1.2 SMBOs improve performance?

In contrast, there are some arguments that support the idea of performance improvement by SMBOs. With regards to PE firms, in the primary buyout phase, the literature suggests that PE-backed companies can obtain greater performance improvement in buyouts, compared to non-PE-backed companies (Jain and Kini, 1995; Meuleman et al., 2009). This is due to PE monitoring participation in the management of the target companies (Cressy et al., 2007). Kaplan and Strömberg (2009) also claim that PE firms' strong industry background and operational experience can improve the target companies' performance. However, PE funds have a limited life span. When the fund approaches the end of its lifetime, the primary PE firms will be forced to exit from the buyouts. We, therefore, hypothesize that at least some of the funds would reach their end before all potential improvements to the portfolio companies are achieved. Furthermore, there is evidence that some of the PE funds may exit their portfolio companies early in order to generate a track record of success to enhance their reputation (Jenkinson and Sousa, 2014; Harford and Kolasinski, 2010; Strömberg, 2008; Achleitner et al., 2011). Furthermore, in the SMBO phase, the secondary PE firms may possess specific complementary knowledge and skills (Acharya et al., 2013; Jenkinson and Sousa, 2014), which may help them to find performance improvement potentials. For instance, some primary buyout target companies are small private companies, backed by relatively small PE firms (Kitzmann and Schiereck, 2009). When the target companies are mature and expand, the small PE firms are unable to

manage them based on their limited experience and human resource. Therefore, it is more optimal to be sponsored by bigger PE firms with more personnel and experience (Wang, 2012). With respect to management, they usually remain on the boards (of these companies) and purchase some equity in the SMBOs with good prospectus (Wright, 2000b). Target companies may, therefore, still benefit from the continuing involvement of PE firms and management.

Hypothesis 2: SMBOs outperform in post-SMBO period.

2.2.2 The determinants of post-SMBO performance

2.2.2.1 Managerial ownership

Buyout investors improve the incentive alignment between managers and shareholders by motivating managers to make a meaningful investment (Jensen, 1989; Kaplan, 1989a). The greater the share managers invest in, the stronger incentive they will have to improve the performance. A number of studies demonstrate that increased management equity shares can improve companies' performance (e.g. Nikoskelainen and Wright, 2007; Phan and Hill, 1995; Thompson et al., 1992; Malone, 1989).

The motivation of managers reinvesting in SMBOs, however, is questionable. They have already participated in the ownership. And the managerial ownership and performance could have a non-monotonic relationship.[14] High levels of managerial ownership can cause dilution of control by PE firms. Management may be able to take very risky investments, causing worse performance in SMBOs.

Achleitner et al. (2012b) find that in the absence of different skills among primary and secondary PE firms in a SMBO, the impact of incentive alignment is positively related

[14] Ozkan and Ozkan (2004), for example, report a significant non-monotonic relationship between managerial ownership and cash holding.

to the managerial ownership. They argue that the management commits relatively little resources in the primary buyout. In the secondary round, after they fully understand the intention and reward of the management package, the increased managerial ownership makes the incentive alignment more effective. Furthermore, other managers (middle managers) will be attracted by the benefits and invest their own money in secondary rounds, result in more effective incentive alignment. Overall, reinvesting by existing shareholder-managers signals, outside investors, their confidence in the company. The impact of managerial ownership in SMBOs will, therefore, continue to create operational value. Hence,

Hypothesis 3: Managerial ownership is positively related to post-SMBO performance.

2.2.2.2 Leverage

Higher leverage also avoids the management to waste money due to the obligation to pay for principals and interests (e.g. Kaplan 1989b, Kaplan and Strömberg, 2009, Harford and Kolasinski, 2010). The lower the ratio of profits or cash flow to interest payments, the greater the leverage is (Nikoskelainen and Wright, 2007).

Hypothesis 4: Leverage is positively associated to post-SMBO performance.

2.3 Data and methodology

2.3.1 Data and sample descriptive statistics

We started our data collection from the Centre for Management Buyout Research (CMBOR) database. [15] The original deal list consists of 612 UK SMBOs with exits during 2000-2007. We also hand-collected data on activities, deal values, PE backing, names of PE

[15] CMBOR database uniquely has a comprehensive coverage of all types of UK buyouts from the 1960s.

firms for PE-backed SMBO, and capital structure in the transaction year from CMBOR, Thomson One Banker, websites of PE firms, and the website www.growthbusiness.co.uk. Our sample ended in 2007 in order to track the long term operating performance.

We cross checked the SMBO deal list with the buyout deals in Thomson One Banker. There were 3216 UK buyouts in Thomson One Banker between 2000 and 2007, including buyouts such as IBO, MBO, MBI, and BIMBO. We checked both the names and announced dates of the buyouts. For those we were not sure of by names, we checked their previous buyout and exit dates for which we tracked back to before 2000 and tracked forwards to after 2007, respectively. This procedure matches 305 SMBOs in the original list with Thomson One Banker's LBOs list, remaining either ambiguous (79) or cannot find matched LBOs (228). Thomson One Banker only has 167 SMBO deals in UK from 2000 to 2007. By using the similar matching method, only 135 deals in Thomson One Banker can be matched with the original CMBOR deal list.[16]

Thomson One Banker and Worldscope are two commonly used worldwide databases cited in the literature due to their reliability and comprehensive data collection for public companies. Specific to our case, however, the majority of target companies are missing in Thomson One Banker and Worldscope, as they are small- and medium- size private companies. Thus, we chose the FAME database to collect the financial information. Through using the FAME database, we were able to collect accounting data up to 10 years, corporate structures and the corporate family, shareholders, subsidiaries, and industry for 516 sample SMBOs. In order to examine the impact of SMBO, for SMBOs exited before December 31st, 2010, we only collected the accounting data from three years before SMBO to the year exited from SMBO. For SMBOs that were not exited by that date, we collected

[16] The business and company-related news and M&A deals and rumors are from Zephyr database which is a comprehensive M&A database with integrated company details.

the accounting data from three years before SMBO to the fifth year after SMBO. We excluded SMBOs from the financial industry since their accounting reports differ from other industries. Our final sample consisted of 491 SMBOs.

Based on the 491 SMBOs, we collected the data of managerial ownership and leverage. Since there are no public sources providing the managerial ownership data of private companies, we manually collected the data from annual returns by proceeding in the following ways. First, although there are many individual investors in the ownership structure, there is no obvious information on the positions of some individuals in annual returns. Hence, we used Amadeus database to identify whether one individual investor belongs to the senior management team. Second, we calculated the managerial ownership of the senior management team. For those that were not employees in the companies, we checked their relationship with other managers. Indeed, family members of some managers also hold shares. We counted this part of shares as shares belonging to the relevant managers. In some cases, some managers also use their trustees to invest, so we added this to their percentage of equity shares.

Figure 2.1 presents the distribution of population and sample SMBOs from 2000 to 2007, by entry (Panel A). This figure demonstrates the number of SMBOs has increased dramatically from 2000, which is consistent with the findings of other worldwide or European SMBO studies (e.g. Jenkinson and Sousa, 2014; Achleitner and Figge, 2014). Panel B demonstrates an increasing trend in the number of exit SMBOs, from 2002 to 2007. During 2007 to 2009, the number of exit SMBOs decreases dramatically, due to the worldwide financial crisis.

Insert Figure 2.1 about here

Among 491 sample SMBOs, 323 deals are PE-backed, while 168 deals are not

(Table 2.1). The trade sale (82 deals) is the most popular exit route from SMBO. Tertiary management buyout (69 deals) is the second popular exit route, followed by receivership (41 deals). Finally, 287 SMBOs remained as SMBOs by December, 31st, 2010.

Insert Table 2.1 about here

According to traditional 2-digit SIC code industry classification, our sample SMBOs are classified into 59 separate industries. However, these industries were too narrow to do our following analysis due to data limitations. Therefore, we adopted the industry classification scheme from Gompers *et al.* (2008) to reclassify our sample into 9 broad industries based on Venture Economics' industry classification (VEIC). These industries are Internet and Computers, Communications and Electronics, Business and Industrial, Consumer, Energy, Biotech and Healthcare, Financial Service, Business Service, and all others. As a consequence, the 9 industry classes are more in line with the technology and management expertise in venture capital industry. For details, the Business Services includes companies associated with: services, transport, hotel, leisure, paper and packaging, wholesale, and distribution. The Business and Industrial includes companies associated with: manufacturing, construction, engineering, house building, vehicles and sheep building, steel, metals, and non-metals. For other industry classes, we linked 3-digit primary US SIC code of our sample companies and VEIC industry group, by using the concordance of VEIC code and US SIC code (Dushnitsky et al., 2009).[17] This procedure identifies the VEIC industry group of US SIC code. Finally, we reclassified our sample into 8 industry classes (excluding Financial Service). When we did not access the SIC code, we assigned industries classes in the light of their transaction activities. The results of our sample industry distribution by exit status, exit routes, and PE backing are reported in Table 2.2.

[17] We are indebted to Gary Dushnitsky for providing us with the concordance that links VEIC and SIC schemes.

Insert Table 2.2 about here

Noticeably, Business Services (41% and 203) is the largest industry group in our sample. As to exit routes, in terms of percentage (Panel A), IPO exit tend to be more popular than other exit routes in Internet and Computers, Communication and Electronics, and Consumer. Tertiary management buyout and receivership exits tend to be more popular in Business Services. However, in terms of numbers of SMBOs (Panel B), Trade sales tends to be more popular in Business and Industrial and Consumer while Tertiary management buyout are the most popular exit route in Business Services.

2.3.2 Variables and methodology

2.3.2.1 Performance measures

This chapter uses three different dimensions of performance measures at company level, including profitability, productivity, and growth. Profitability is considered the direct reflection of buyout value creation. To measure profitability, we used return on assets (*ROA*) and return on sales (*ROS*) which are estimated as earnings before interests and taxes (*EBIT*) scaled by total assets and revenue, respectively. One of the limitations of *ROA* is related to use of total assets. For example, due to historic cost accounting, changes in total assets may affect *ROA* while actual profitability may remain the same. The limitation of *ROS* is that it does not reflect the actual productivity of the assets, as it could be improved by the enhanced marketing strategy. Therefore, we employ both measures to test the profitability.

Although profitability is crucial, it cannot capture all behavioral aspects motivated from agency and strategic entrepreneurship activities. We, hence, employ productivity (*SALEMP*) and growth ratios. Productivity (*SALEMP*) captures output and input ratio of the company and is measured by inflation adjusted sales scaled by the number of employees. Following Meuleman et al. (2009), growth ratios are measured by sales growth (*SALG*) and

employment growth (*EMPG*). They are two most commonly used indicators in entrepreneurial growth literature (Delmar et al., 2003). Sales growth captures growth in additional revenue creation while employment growth captures the growth in labor resources. Unlike Meuleman et al. (2009), we use the average value of sales or the number of employees in year t and year t-1 as denominator[18]. Sales growth (*SALG*) is the difference between sales in year t and year t-1 scaled by their average value. Employment growth (*EMPG*) is the difference between the numbers of employees in year t and year t-1 scaled by their average value.

2.3.2.2 Abnormal performance

There are two approaches commonly used to measure abnormal performance after a corporate event or decision (Ghosh, 2001; Powell and Stark, 2005). The first approach is combined with 'level' and 'change' models which we will discuss in detail later. The second approach is a regression-based model introduced by Healy et al. (1992), involving regressing the industry adjusted performance after event on the industry adjusted performance before event. The slope coefficient is the multiple of the post-event industry adjusted performance on pre-event industry adjusted performance. The intercept measures the abnormal performance arising from the event. If we constrain the slope coefficient to one, the regression-based model is the same as the 'change' model. In fact, there is no consensus on the preference of the two approaches. In this chapter, we prefer the first approach as the majority of the buyout literatures does. This is because the 'level' and 'change' models approach allow us to observe abnormal performance year by year during the entire post-SMBO period. Second, the regression-based model fails to produce a

[18] Using average values as denominators to measure the growth rate is common in the literature of analysing dynamics or expansion of the companies, as it is similar to the log differences in terms of some properties while also accommodates entry and exit (Davis et al., 1996).

reliable measure of abnormal performance for each target company that we will use to analyze the determinants of post-SMBO abnormal performance.

Following Barber and Lyon (1996), we use both 'level' and the 'change' models to estimate the expected performance. The 'level' model uses unadjusted changes as expected performance. The 'change' model uses the industry adjusted median as the benchmark. The industry benchmark is widely used in the literature which controls for the omitted variables bias in the 'level' model that only uses the company's prior performance as a benchmark. The omitted variables bias could stem from business life cycles, industry technical development, and the financial crisis. These factors could enable significant trend changes after the event year. The expected performance models are as follows:

$$E(P_{it}) = P_{i,t-k}; \qquad \textit{(Equation 1)}$$

$$E(P_{it}) = P_{i,t-k} + \Delta PI_{it} \ ; \qquad \textit{(Equation 2)}$$

Where P_{it} denotes the performance of company i in period t. $E(P_{it})$ is the expectation of performance of company i in period t. P_{it-k} is k-year median pre-event performance of company i. PI_{it} is defined as the performance of industry control group for company i in period t. ΔPI_{it} is the difference between industry control group's pre-event performance and post-event performance in period t. Equation 1 is 'level' model, while equation 2 is 'change' model.

Earnings may be overstated in the year before the event is announced (Jain and Kini, 1994). Hence, many studies adopt the median performance of several years before event. In this study, we will employ the median value of three years prior to the event (-1 to -3) to be the pre-event performance. Then, we compare the performance in each post-event year with the pre-event performance, up to five years. Hence, the abnormal performance could be calculated as the difference between actual performance and expected performance. The

formula is as follows:

$$AP_{it}=P_{it}- E (P_{it}) \quad \textit{(Equation 3)}$$

Where, P_{it} is the actual performance of company i in year t; AP_{it} is the abnormal performance for various performance ratios: *ROA*, *ROS*, *SALEMP*, *EMPG*, and *SALG*. We will exclude the event year 0. Because this year includes both pre-and post- event operations, it is difficult to define this year as pre-event year or post-event year. In our univariate analysis, we test whether the abnormal performance is significantly changed from the first to the fifth post-event year. All estimates in our analysis are based on 99% winsorized data, in order to eliminate the influence from outliers. In addition, we employ a Wilcoxon signed-rank test to test whether the median value of abnormal performance in each post-event year equals to zero or not.[19]

2.3.2.3 Regression model

We adopt a panel regression via a GLS random-effects procedure with robust standard error and omitted collinear covariates to examine our hypotheses. We employ the panel regression instead of OLS because the panel regression uses the data from the entire post-event (i.e. SMBO) period while OLS either takes average values across the period or relies on data from only one post-event year. More specifically, our univariate analysis shows a decline in post-SMBOS period. Unlike the OLS regression, the panel regression takes into account this trend by including data from the entire post-event period. In addition, the panel regression considers the impact of estimation error caused by the correlation of the residuals across companies (Fama and French, 2001).

[19] We decide the accounting year closed on and after deal announced date as year 0. For those deals that are announced on the dates after the accounting year closed dates, we treat the following accounting year as year 0. For example, the accounting year of the target company for 2000 is from October, 1999 to September, 2000. If a SMBO is announced in January, 2000, we will define the accounting year 2000 as year 0. If the SMBO is announced in October, 2000, we will define the accounting year 2001 as year 0.

Thus, we regress the abnormal performance (*AROA, AROS, ASALEMP*, *AEMPG*, and *ASALG*) with variables of managerial equity ownership (*MGTSHARE*) and leverage (*DEBTCOV*). Control variables are PE firms' involvement (*PE*), the nature logarithm of SMBO's deal value (*LNSIZE*), the financial crisis effect (*Crisis*), performance in the form of ROA in the year before SMBO transaction (*ROAt-1*), and the duration in SMBOs (*LNDURATION*). Entry year dummies and industry dummies are included to control for time factor and industry factor. The regression model is as follows:[20]

$$AP_{it}=\alpha+\beta_1 MGTSHARE_{it}+\beta_2 DEBTCOV_{it}+\beta_3 PE_i+\beta_4 LNSIZE_i+\beta_5 Crisis_{it}+\beta_6 ROAt\text{-}1_i$$
$$+\beta_7 LNDURATION_i+\varepsilon_{it} \qquad \textit{(Equation 4)}$$

2.3.2.4 Variables

1) *Managerial equity ownership.* In order to enhance incentive alignment between managers and shareholders, buyout investors require the managers to invest their own money in the equity shares (Jensen, 1989; Kaplan, 1989a). The greater the share the management invests in, the stronger incentive they will have to improve performance. Following Nikoskelainen and Wright (2007), we use the management's share in proportion to the total equity in year t (*MGTSHARE*) as the variable for management equity ownership.

2) *Leverage.* We adopt debt coverage (*DEBTCOV*) to measure the debt's controlling effect. The more time needed to pay off the debt, the greater the incentive management will have to improve performance. It is estimated as the amount of long term and shot term debt of the target company in year t scaled by the operating income before interests, taxes, depreciation and amortization (*EBITDA*) in year t.

3) *Control Variables.* We include several control variables related to the company's

[20] Both the Breusch and Pagan Lagrangian multiplier test and the Hausman test suggest random-effects GLS regression is superior to pooled regression and fixed-effects regression.

performance in our regression analysis. The nature logarithm of SMBO's deal value (*LNSIZE*) is taken into control for the scale effect. Larger companies may be more profitable than smaller ones, while smaller ones may have more opportunities to grow. It is measured by the logarithm of deal value. Our period for performance includes the recent financial crisis. To take this into account, we include a dummy variable (*Crisis*) that equals 1 if the year experiences on financial crisis, and 0 otherwise. We define the calendar years of 2008, 2009, and 2010 as financial crisis years. The pre-SMBO underperforming companies may have greater improvement in performance after SMBO. Hence, we control for the previous profitability performance, which is measured by the performance in one year before SMBO (*ROAt-1*). PE backing (*PE*) is also included to control for the effect of PE firms. Duration (*LNDURATION*) measures the holding period in SMBO, which is the logarithm of the number of months from the SMBO date to the exit date if the SMBO exits or the number of months from the SMBO date to the last date if the SMBO does not exit. It controls for the influence of the longevity of buyout. The longer the holding period, the less the performance can be improved.

2.4 Results

2.4.1 Univariate analysis

Sample descriptive statistics and correlation are presented in Table 2.3.[21] In Panel A, PE-backed SMBOs are approximately three times as large as their non-PE-backed counterparts. Moreover, average debt coverage is 5.025 (median=1.434), confirming that SMBOs have high leverage[22]. Although the difference in debt coverage between PE-backed and non-PE-backed SMBOs is insignificant, PE-backed SMBOs seem to have more debt

[21] Definitions of variables are presented in Appendix 2. 1

[22] The large difference between mean and median is caused by the skew distribution of debt coverage. Some companies have debt coverage over 100.

capacity than others. Gearing (*GEAR*) of PE-backed SMBOs is significant greater than that of non-PE-backed SMBOs, suggesting that PE-backed SMBOs have a greater fraction of debt on total equity. In addition, management shares of the total equity is 59.8% on average (median=59.9%). 100% of equity non-PE-backed SMBOs are financed by management; while the management of PE-backed SMBOs only invest in 37% equity. The average duration for primary buyout is 59.866 months (almost 5 years), consistent with earlier studies in buyout (Strömberg, 2008). However, the average duration of SMBO is 40.574 (more than 3 years), shorter than that of primary buyout.

Panel B presents the correlation test for all variables used in regressions. The correlation coefficient between managerial ownership (*MGTSHARE*) and PE backing (*PE*) is significantly high (coefficient: -0.68). Considered with the potential multicollinearity issue, we conducted the regressions without control variables (See Appendix 2.3). The results are similar as our main results.[23]

Insert Table 2.3 about here

Table 2.4 reports the results of various performance measures. Panel A and Panel B show the statistics of pre- and post-SMBO performance measures, individually. Panel C presents the differences in the mean and median values of various performance measures between pre-and post-SMBOs with respective p-values. According to the results, we can see that ROA, EMPG, and SALG significantly decrease from pre- to post-SMBO in both mean and median values, while ROS only has significant decrease in mean value. By contrast, *SALEMP* increases significantly in median values after SMBOs. Furthermore, PE-backed SMBOs tend to have better performance in terms of profitability and growth, but worse performance in terms of productivity, related to non-PE-backed deals.

[23] In fact, the coefficient of managerial ownership is marginally significant in the model of *AROA* (we obtain the similar results by using fixed effect models, see Appendix 2.2).

Insert Table 2.4 about here

Table 2.5 presents the median values of unadjusted abnormal performance ratios ('level' model based on equations 1 and 3) and industry adjusted abnormal performance ratios ('change' model based on equations 2 and 3) up to five years after the SMBO transactions. To estimate the industry adjusted abnormal performance ratios, we collected performance data for all UK active and inactive private companies (40,267 companies) from the FAME database and estimated the relevant median ratios based on the industry classification strategy described above.

Insert Table 2.5 about here

Our unadjusted abnormal performance of profitability ratio *AROA* is significantly negative in each post-SMBO year, from -0.008 in the first year to -0.047 in the fifth year, consistent with previous UK SMBO studies (Jelic and Wright, 2011; Wang, 2012). When scaled by sales, profitability (*AROS*) shows statistically insignificant increases (0.008) in the first year after SMBO, followed by a statistically significant decrease (in years four and five). The industry adjusted abnormal performance also show similar statically significant negative results, with greater magnitude. SMBO target companies may underperform their industry peers. Other than these, all ratios show a decreasing trend during the five years after SMBO. One explanation is that companies may obtain expansion which causes an increase in non-productive assets, resulting in sales scaled ratios being unchanged while assets scaled ratios decrease.

Consistent with Jelic and Wright (2011), our results show a significant increase in productivity (measured by *ASALEMP*) up to four years after SMBO. However, the positive change tends to decrease till a significantly negative change in the fifth year after SMBO. Moreover, when we control for industry influence, the positive changes disappear,

suggesting that the positive abnormal performance in productivity may be caused by industry improvement.

As the profitability ratios, significant decreases are observed in the unadjusted growth ratios (measured by *AEMPG* and *ASALG*). Interestingly, after being industry adjusted, sales growth increases in post-SMBO years one and four, although the values are insignificant. In sum, these results offer evidence that performances reduce after SMBO, except from unadjusted productivity.

2.4.2 Regression results

Table 2.6 presents the results of the panel regression.[24] [25] Panel A uses unadjusted abnormal performance measures as the dependent variables, while Panel B uses industry adjusted abnormal performance measures as the dependent variables. In Panel A, R^2 differs from 5.00% of the model for *ASALG* to 24.75% of the model for *AROA.* Wald Chi ^{2} is significant for models with *AROA, ASALEMP, AEMPG,* and *ASALG*, suggesting our models are fitted for the data. It should be noticed that the Ns of our regressions are reduced dramatically, due to our unbalanced panel dataset and the data limitations of independent variables, especially managerial equity ownership (*MGTSHARE*) and leverage (*DEBCOV*). Furthermore, FAME database does not provide accounting information for all companies before 2003. We manually collected accounting data for industry benchmarks for SMBOs from 2000 to 2003. However, we still cannot collect data for certain industries (e.g. Biotech and Healthcare) and performance measures, due to the data limitation. In particular, there are only few companies with accessible accounting data in FAME database before 2001. As a consequence, the Ns of industry adjusted regression are smaller than the Ns of unadjusted

[24] We also carried out fixed effect models (Appendix 2.2). The results are similar but stronger than the results we used GLS random-effects models.
[25] We tried the regression without control variables. The results are economically and statistically similar to our main results (see Appendix 2.3).

regression.

Insert Table 2.6 about here

We predict that managerial equity ownership (*MGTSHARE*) has significant and positive relationship with post-SMBO performance (H3). The coefficient of managerial ownership is predominantly positive but not statistically significant in all models, except the negative and insignificant coefficient in the model of *AROS*. Hence, our results show little evidence that SMBOs with higher managerial ownership perform better, and are thereby inconsistent with the idea that the greater share the management invests, the stronger incentive they will have to improve the performance. Our results are also inconsistent with our prediction that SMBOs with higher leverage (*DEBCOV*) have better post-SMBO performance (H4). For instance, the coefficient of leverage is significant and negative in the models of *AROA* measured abnormal performance of profitability (coefficient: -0.000, z-stat: -5.145) and *ASALEMP* which measures abnormal performance of productivity (coefficient: -0.001, z-stat: -3.578). However, the magnitude of the coefficient is very small which almost could be zero. Taking the model of *ASALEMP* as an example, a one unit increase in leverage only create 0.1 percentage decrease in post-SMBO abnormal performance in productivity. These results imply that the disciplining effect of high leverage disappears in the secondary round, inconsistent with the results of Smit and Volosovysvh (2013) that leverage change is positively related to post-SMBO performance. On the one hand, high debt does not motivate a target company's management to improve performance as primary buyouts. On the other hand, the debt burden beyond the companies' capacity and high levels of debt will increase the failure risk of the target company. In Panel B, we find that when we use industry adjusted abnormal performance measures, the values of R-square increase for all models except from the model of *AROA*. Furthermore, the

results are similar to the results in Panel A, while the absolute values of z-statistics of leverage in models for *AROA* and *ASALEMP* are greater than their counterparts (z-stat: -5.638 and -3.726, respectively), implying that, after controlling for the industry changes in performance, leverage has stronger influence on post-SMBO performance.

With regard to control variables, we find that the coefficient on pre-SMBO performance (*ROAt-1*) is significant and negative in models for both *AROA* and *AROS* measured profitability in both panels, suggesting that companies with better pre-event performance have less ability to improve these performances after SMBO. The potentials of performance-especially profitability improvement of better deals (companies with better previous performance), may be exhausted by primary investors to a large extent. Hence, the achievements of the second stage could not exceed those of the primary stage. This provides some evidence in support of H1. Our results show size (*LNSIZE*) is significantly and positively associated with the models for *AROS*. We also find evidence that financial crisis (*Crisis*) does harm to post-SMBO performance. For instance, the financial crisis is significantly and negatively related to post-SMBO abnormal performance in employment (*AEMPG*) and sales growth (*ASALG*) (both unadjusted and industry adjusted) and industry adjusted productivity (*ASALEMP*). PE backing (*PE*) SMBOs do not seem to be associated with changes in performance, with the exception of productivity models. The results show that PE backing has a positive relationship with post-SMBO abnormal performance in productivity (unadjusted: coefficient: 0.110, z-stat: 2.587; industry adjusted: coefficient: 0.106, z-stat: 2.597), indicating that PE-backed SMBOs perform better that non-PE-backed SMBOs in productivity.

2.5 Robustness and further analysis

In this section we conduct some robustness tests and further analysis. First, we

present the results for the alternative measures of profitability. Next, we use alternative benchmarks to examine the post-SMBO abnormal performance. This is followed by examination of the post-SMBO abnormal performance of subsamples in terms of different exit routes. We then discuss the post-SMBO abnormal performance of subsample with primarily holding period data. Furthermore, we investigate the post-SMBO abnormal performance by PE backing. In addition, we examine the alternative measure of leverage. Finally, we consider the potential sample selection bias.

2.5.1 Alternative measure of post-SMBO performance

In our univariate analysis, we employ EBIT to estimate profitability. However, this measure could be obscured by depreciation and amortization, which could be used to manage earnings. Thus, in order to test robustness, we adopted alternative profitability measures by calculating it as the operating income before depreciation and amortization scaled by total assets (*EBITDAA*) or sales (*EBITDAS*). The results are presented in Table 2.7.

Insert Table 2.7 about here

The results suggest significantly negative changes in both unadjusted and industry adjusted profitability scaled by total assets (*AEBITDAA*) from the first to the fifth post-SMBO year. When scaled by sales, the changes in the first two years lose significance. Our results show a reducing trend from the first to the fifth post-SMBO year. These results are consistent with our findings with *EBIT*, except that *EBITDA* yields worse profitability than *EBIT*. We expect an increase in depreciation and amortization caused by increases in non-productive assets. This supports our explanation about the worse performance of *ROA* than that of *ROS*.

2.5.2 Alternative benchmarks of post-SMBO performance

Barber and Lyon (1996) find that failure to consider the size and pre-event performance of the company will create bias when examining post-event abnormal performance. Second, buyouts can create significant performance changes in the target companies, due to their special ownership structure and governance mechanisms. The abnormal performance of SMBOs based on the 'level' and 'change' models could be attributed to the underperformance of the whole buyout industry. Third, the performance improvement sources for public-to-private deals are unlikely suitable to private-to-private deals (Chung, 2011).

Therefore, in order to further investigate performance after SMBOs, we also used the private-to-private MBOs without SMBO experience (primary MBOs) as benchmark.[26] We matched our sample with primary MBOs based on 8 industries, size (measured by the logarithm of median total asset three years before buyouts), and pre-event performance (measured by median *ROA* three years before buyouts). Since this matching approach concerns on multiple dimensions, we adopted Propensity Score Matching method (PSM) similar to Rosenbaum and Rubin (1983). Traditional matching methods will decrease the specification and power of statistic results when encountering multiple matching dimensions. PSM transfers all matching dimensions into a proxy named propensity score, with reducing the biases generated by traditional matching methods.[27] For PSM, we used Probit estimation and one by one nearest matching without replacement.[28] After obtaining 358 matched pairs, we still matched the calendar year in which the transaction was completed. This procedure results in 152 SMBOs matched with 152 primary MBOs. This

[26]SMBO could be viewed as a type of private-to-private management buyouts.
[27] Li and Zhao (2005) and Cheng (2003) test both traditional multiple-dimensional matching method and PSM and find that there are abnormal performances under PSM while not under traditional method. Rin et al. (2011) also state that PSM takes advantage of matching on observations.
[28] Unreported results find that one-by-one nearest matching with replacement shows similar results.

matching process results in primary MBOs matched with multiple SMBOs. For those 9 primary MBOs that were matched with multiple SMBOs, we calculated the average values of these SMBOs as counterparts. The abnormal performance was calculated as the difference in performance between SMBO and primary MBO in year t after transaction minus the difference of performance between SMBO and primary MBO before transaction year.

The results are presented in Table 2.8. Panel A presents the comparison between full samples of SMBOs (491 deals) and primary buyouts (348 deals). This Panel demonstrates significant underperformance of SMBOs in terms of profitability, productivity, and growth, in spite of significantly outperformance of SMBOs in the first year after transaction in terms of productivity. The results of comparison between matched samples are reported in Panel B. These results show even worse performance in SMBOs, compared to primary MBOs. This could be because of the outperformance of primary MBOs after transactions. Our findings support the evidence obtained above that performance deteriorates after SMBOs. Especially, compared to matched primary MBOs, the outperformance in productivity disappears.

Insert Table 2.8 about here

2.5.3 Post-SMBO performance by exit routes

If SMBOs do not improve, the SMBOs are unlikely to exit via IPO. In Table 2.2, we see there are still SMBOs exited through IPO and trade sales. TMBO is still the second most popular exit route. This may imply the existence of selection bias in our analysis. Specialists and managers may sell their shares in more successful companies in IPO or sell these companies to other companies. If this selection bias is present, our sample still includes successful SMBOs. Especially, the IPO and trade sales deals will perform

differently from others.

We divided our sample into subsamples by exit routes and compared their post-SMBO performance. The first group consists of exit and non-exit SMBOs. The comparison results are reported in Panel A in Table 2.9. There is no significant results to support the suggestion that exited SMBOs outperform non-exited SMBOs. We compared the post-SMBO abnormal performance of SMBOs exited via IPO, trade sales, and receivership with the post-SMBOs abnormal performance of SMBOs exited via TMBO. The results are shown in Panel B. IPO deals perform significantly better than TMBO deals in growth. Despite not being significant, there is some evidence that IPO deals also have better performance in profitability. Trade sales deals significantly outperform TMBO deals in productivity. Also there is some evidence that trade sales deals outperform TMBO deals in employment growth, without significance. Receivership deals underperform TMBO deals in all performance in the first post-SMBO year. The results are significant in *ROS* and sales growth. Surprisingly, after the first year, TMBO deals seem to underperform receiverships.

Insert Table 2.9 bout here

2.5.4 'Early' vs. 'Late' exits

As discussed in Section 2.2, on the one hand, primary PE funds may be forced to exit within the typical holding period due to several reasons such as the limited life of PE funds and chasing a better reputation. Even PE funds may exit early to create a track record for their reputation. When PE funds exit early, especially in the first 2-3 buyout years, the performance improvement potential would likely not be exhausted by value creation mechanisms. There still is the probability of positive performance improvement, no matter what the ownership structure is. One the other hand, SMBOs could be adopted as a 'last resort' when the holding period exceeds the typical holding period. In such circumstance,

PE funds exist in current portfolio too long to create value and to find a good exit route. If these are true, SMBOs with the two purposes may present different abnormal performance after SMBO. Hence, it is necessary to investigate the post-SMBO performance in terms of the holding period in primaries.

We collect the data of primary holding period and divide the sample SMBOs into the 'early' and 'late' exits subsamples. The 'early' exit subsample is defined as those cases where the primaries' holding period is shorter than 2 years. The 'late' exit subsample is defined as those where the primaries' holding period is equal to or longer than the typical holding period, 4 years. The abnormal performances of the two subsamples in SMBO phase are presented in Table 2.10. Although our results suggest a lack of improvement in the performance in the 'early' exit subsample, they do not show the significant evidence of decrease. Indeed, we only observe significant and positive abnormal performance in unadjusted productivity in the first and fourth years after transaction, and significant and negative abnormal performance in the fifth year. The results for other performance measures, no matter unadjusted or industry adjusted, are not statistically significant. In the 'late' exit subsample, we find mixed evidence in terms of profitability. Whilst *AROA* shows deterioration over five years after SMBOs, *AROS* shows improvement in the first post-SMBO year. Also, similar to results obtained in the univariate analysis, productivity obtains improvement in the first three years after transactions, while when using industry adjusted benchmark, the results are consistent with *AROA*. Besides, in terms of growth ratios, SMBOs only underperform in employment growth in the third year and in sales growth in the fifth year. Comparing the two subsamples, we can easily see that 'early' exit subsample perform better than 'late' exit subsample to some extent, lending some evidence to support the conjecture that SMBOs with short primary holding period seem to have more potential

for performance improvement than others.[29]

Insert Table 2.10 about here

2.5.5 Does PE backing matter?

The literature suggests that PE-backed companies can obtain greater performance improvement in buyouts than non-PE-backed companies. This is because firstly PE firms monitor the management to eliminate the agency costs and participate in the management of the companies in which they invest and take a position on the board of directors (e.g. Cressy et al., 2007). Secondly, the professionals in PE firms have a strong industry background and operational experience (Kaplan and Strömberg, 2009), which can drive value creation (Meuleman et al., 2009). For instance, Jain and Kini (1995) claim that venture capitalists could use their expertise and monitoring to add value for entrepreneurial firms. Siegel et al. (2011) also argue that the effects of PE funds on the post-investment performance of their portfolio companies are closely related to the prior experience and specialist sector expertise of their fund managers. In regressions, we included PE backing as one explanatory variable and find that PE-backed SMBOs perform better than others in terms of productivity. Next, we carried out a comparison of post-SMBO abnormal performance of PE-backed and non-PE-backed subsamples. The results are presented in Table 2.11.

PE-backed SMBOs generally have better performance in terms of profitability (*AROS*) and productivity *(ASALEMP)* than non-PE-backed SMBOs up to three to four years. However, the differences are statistically significant only in respect of productivity,

[29] We also tested the abnormal performance of SMBOs that have primary holding period larger than and equal to 2 years but shorter than 4 years (Please see Appendix 2.4). Similar to 'late' exit subsample in Table 4.10, the results also show significant and negative abnormal performance in *AROA, AROS, AEMPG*, and ASALG. Nevertheless, it should be noticed that the industry adjusted *AROA* and *ASALEMP* of 'late' exit subsample tend to be worse than those of 'middle' exit subsample. Moreover, as 'late' exit subsample, 'middle' exit subsample tends to underperform 'early' exit subsample.

consistent with our regression results. Furthermore, in contrast with Jelic and Wright (2011), our results in profitability (*AROA*) demonstrate that PE-backed SMBOs significantly underperform their counterparts in year three and five. The results of growth performance fluctuate over the five years after the SMBO transactions. Generally, PE-backed SMBOs outperform in growth in the first post-SMBO year and underperform in the following two or four years before reversing. Overall, the results provide mixed evidence of the impact of PE backing on post-SMBO performance.

Insert Table 2.11 about here

2.5.6 Alternative measure of leverage

In the previous section, we identified a negative relationship between leverage and post-SMBO performance. To estimate its robustness, we used another well-known ratio, gearing, as an alternative measure of leverage instead and reran the regressions with unadjusted performance ratios. We estimated gearing (*GEAR*) as the sum of long term and shot term debt divided by the total equity. In fact, due to the special ownership structure of management buyouts, gearing also could be used as a proxy for managerial equity holding. The more debt is required for financing, the fewer shares managers will purchase (Nikoskelainen and Wright, 2007). Gearing shows how much fund is borrowed as the percentage of equity. As a consequence, managers will have less incentive to improve performance. Combined with its implications in terms of both debt discipline and the impact of management alignment, we expect a negative relationship between gearing and post-SMBO abnormal performance. The results are presented in Table 2.12.[30]

Insert Table 2.12 about here

The coefficient of gearing is significant and negative in the models for *AROA*

[30] GEAR has more firm-year observations than DEBCOV (Please see Table 2.3), which results in higher Ns compared to Panel A of Table 2.6.

(coefficient: -0.017, z-stat: -2.321) and *AROS* (coefficient: -0.012, z-stat: -3.528), consistent with the results by using debt coverage. Nevertheless, the magnitude of the coefficient of gearing is greater than those of debt coverage. For instance, a one unit point increase in gearing will lead to a 1.7 percent decrease in post-SMBO performance in *AROA*, compared to a decrease of almost zero by using debt coverage. The greater impact of leverage could be explained by the dual implications of gearing.

2.5.7 Potential sample selection bias

Our sample descriptive statistics shows that PE-backed SMBOs tend to differ from non-PE-backed SMBOs in terms of industry distribution, size, and pre-event performance. These differences suggest that PE firms may not choose a random company to invest in. They may do due diligence to choose good companies which may have more probability of success after SMBOs. Hence, it is important to control for the PE firms' sample selection bias when studying the impact of governance mechanisms on post-SMBOs performance. To address the sample selection bias, we followed Jelic and Wright (2011) and adopted Heckman's (1979) two-step estimation procedure. In the first step, we use a Probit regression to estimate the probability of receiving PE backing (*Lambda*). The dependent variable is a PE dummy (*PE*) which equals 1 if PE-backed and 0 otherwise. The estimated variable (*Lambda*) will be added as an independent variable to correct the sample selection bias in the second stage for explaining the post-SMBOs performance. The second stage employs the same panel regression as equation 4.

We hypothesize that the choice of PE backing would be associated with size, pre-event performance, and industry. For instance, Brau et al. (2003) argues that small companies may not be successfully listed. Strömberg (2008) finds a significant association between size and exit routes. Bienz (2004) highlights that highly profitable companies are

easier to take public. Sudarsanam (2005) finds operating performance is one of the determinants of the exit routs. PE firms tend to invest in companies with good performance that means promising prospects. Baya and Chemmanur (2006) argue that industry characteristic could influence on the exit strategy choice. For example, highly fragmented industries like services are more likely to be sold to strategic acquirers (e.g. large companies in the same industry), while they are less likely to be sold to a financial acquirer (e.g. private equity firms). The Probit model is as follows:[31]

$$PE_i=\alpha+\beta_1 BSERVICES_i+\beta_2 LNSIZE_i+\beta_3 ROAt\text{-}1_i+\varepsilon_i \qquad \textit{(Equation 5)}$$

Where, *PE* equals 1 if the SMBO is PE-backed and 0 otherwise; *BSERVICES* equals 1 if the SMBO's target company is from Business Service industry and 0 otherwise. *LNSIZE* indicates the nature logarithm of SMBO's deal value. *ROAt-1* is return on assets in one year before SMBOs.

In the second stage model, the regression model is as follows:

$$AP_{it}=\alpha+\beta_1 MGTSHAR_{it}+\beta_2 DEBTCOV_{it}+\beta_3 PE_i+\beta_4 LNSIZE_i+\beta_5 Crisis_{it}+\beta_6 ROAt\text{-}1_i$$
$$+\beta_7 LNDURATION_i+\beta_8 Lambda_{it}+\varepsilon_{it} \qquad \textit{(Equation 6)}$$

Where, the variables are the same as equation 4. *Lambda* is the fitted probability of receiving PE backing which is estimated from the first stage. The results of our first stage regression analysis are reported in Panel A of Table 2.13. Size is positively and significantly associated with PE backing (coefficient: 1.298), suggesting that PE firms tend to choose larger target companies in which to invest. Similarly, pre-SMBO profitability performance (measured by *ROAt-1*) has a positive and significant relationship with PE backing (coefficient: 0.626), consistent with the results in Table 2.4 that suggest that PE-backed SMBOs perform better in profitability before SMBO transactions. This result indicates that

[31] A Hosmer-Lemeshow goodness of fit test justifies our preference for Probit over Logit model.

SMBOs that have better previous performance are more likely to receive PE backing. The industry dummy (*BSERVICES*) is negatively and significantly associated with PE backing (coefficient: -0.234). Panel B shows the results are qualitatively similar as those in Table 2.6. *Lambda* is only significant for *AROA* models (unadjusted: coefficient: -0.074, z-stat: -1.850; industry adjusted: coefficient: -0.130, z-stat: -2.233) but not statistically significant for others, suggesting that sample selection bias might be a problem for the former. Thus, we conclude that although sample selection bias exists in our data, it does not affect our results of the main explanatory variables.

Insert Table 2.13 about here

2.6 Conclusion

Using a unique, hand-collected dataset of 491 UK SMBO deals from 2000 to 2007, their exit statuses, and post-SMBO performance of target companies, we first investigated whether SMBOs improve the performance of target companies or not. Second, we examined the impact of traditional buyout governance mechanisms of managerial ownership and leverage on post-SMBO performance.

Our analysis suggests that the most popular exit routs for our sample SMBOs are: trade sales (82 deals), tertiary management buyout (69 deals), and receivership (41 deals). IPO (12 deals) is the least popular exit route. Large SMBOs and SMBOs with better pre-event performance have more probability to be the targets of PE firms. The industry distribution of PE-baked SMBOs is also significantly different from that of non-PE-backed SMBOs.

Our univariate analysis of the changes in performance after SMBO finds strong evidence of a reduction in profitability and growth after SMBO transaction, supporting the buying time hypothesis. As for productivity, the unadjusted abnormal performance shows

significant improvement after SMBOs. But when controlling for the industry benchmark, the results demonstrate decreases, suggesting SMBOs target companies underperform their industry peers in productivity. We also find a decreasing trend in terms of profitability, productivity, and growth from the first to the fifth post-SMBO year. For the robustness test, we use alternative measures for profitability, the results are consistent with our main results. We also compare the post-buyout abnormal performance of our sample with matched primary private-to-private MBOs. We find target companies of SMBOs perform worse than those of primary MBOs in profitability, productivity, and growth, providing more evidence to support the buying time hypothesis.

We carried out some further univariate analysis. First, we compared the post-SMBO abnormal performance by exit routes. The results provided some evidence that SMBOs exited via IPO and trade sales have better post-SMBO performance than SMBOs exited via tertiary management buyouts. This indicates that better companies still choose to exit through IPO and trade sales. Surprisingly, we find SMBOs exited via tertiary management buyouts seem to perform worse than those exited via receivership after the first post-SMBO year. Second, we investigated the comparison of post-SMBOs performance between PE-backed SMBOs and non-PE-backed SMBOs. Our study shows mixed results of the impact of PE backing on post-SMBO performance. For instance, PE-backed SMBOs show significant underperformance in profitability (measured by *ROA*) from the third post-SMBO year, compared with their counterparts. In contrast, PE-backed SMBOs perform better in productivity in the first three post-SMBO years, followed by subsequent underperformance. Generally, PE-backed SMBOs outperform in growth in the first post-SMBO year and underperform in the following two or three years till reversing. Third, we investigated whether the length of the holding period in primary buyout has an impact on

post-SMBO performance. We find that SMBOs exited early in the primary buyouts seem to perform better than those exited late in the primary buyouts. For instance, the results are insignificant in profitability and growth for the former, other than the significant positive abnormal performance in unadjusted productivity in the first and fourth years. Nevertheless, the results for the later show significant reductions in profitability (measured by *ROS)*, industry adjusted productivity, and growth ratios.

Our multiple regression analysis shows that debt coverage is significantly and negatively related to the post-SMBO performance in profitability (measured by *AROA*), productivity (measured by *ASLAEMP*), suggesting that a high debt burden has a detrimental effect on the target companies' performance. We do not find any evidence on the impact of managerial ownership on post-SMBO performance. Moreover, the findings show that PE-backed SMBOs have better performance in productivity than non-PE-backed SMBOs. The above results robust to different abnormal performance measures (using industry adjusted abnormal performance as dependent variables) and different leverage measure (using gearing to proxy for leverage). In addition, sample selection biases do not influence our results.

Overall, our analysis here testifies to the contrasting performance experience of primary and secondary buyouts. The benefits of resolving the agency problem with high debt and incentive alignment of managerial ownership seem to be exhausted in primary buyouts. Rather, the lack of effect of managerial ownership on post-SMBO performance implies the possibility of entrenchment behavior where the management from the primary buyout continues into the SMBO with a larger equity stake and less control by PE firms. The high debt burden seems to exceed the target companies' debt capacity and causes performance decay in the secondary round.

Figure 2.1: Distribution of SMBOs by year

This figure shows the distributions of the population and sample of SMBOs by entry and exit years, from 2000 to 2010. Panel A shows the distribution of SMBOs by entry years while Panel B shows the distribution of SMBOs by exit years. The population is from CMBOR database. The sample is the dataset after employing data selection criteria.

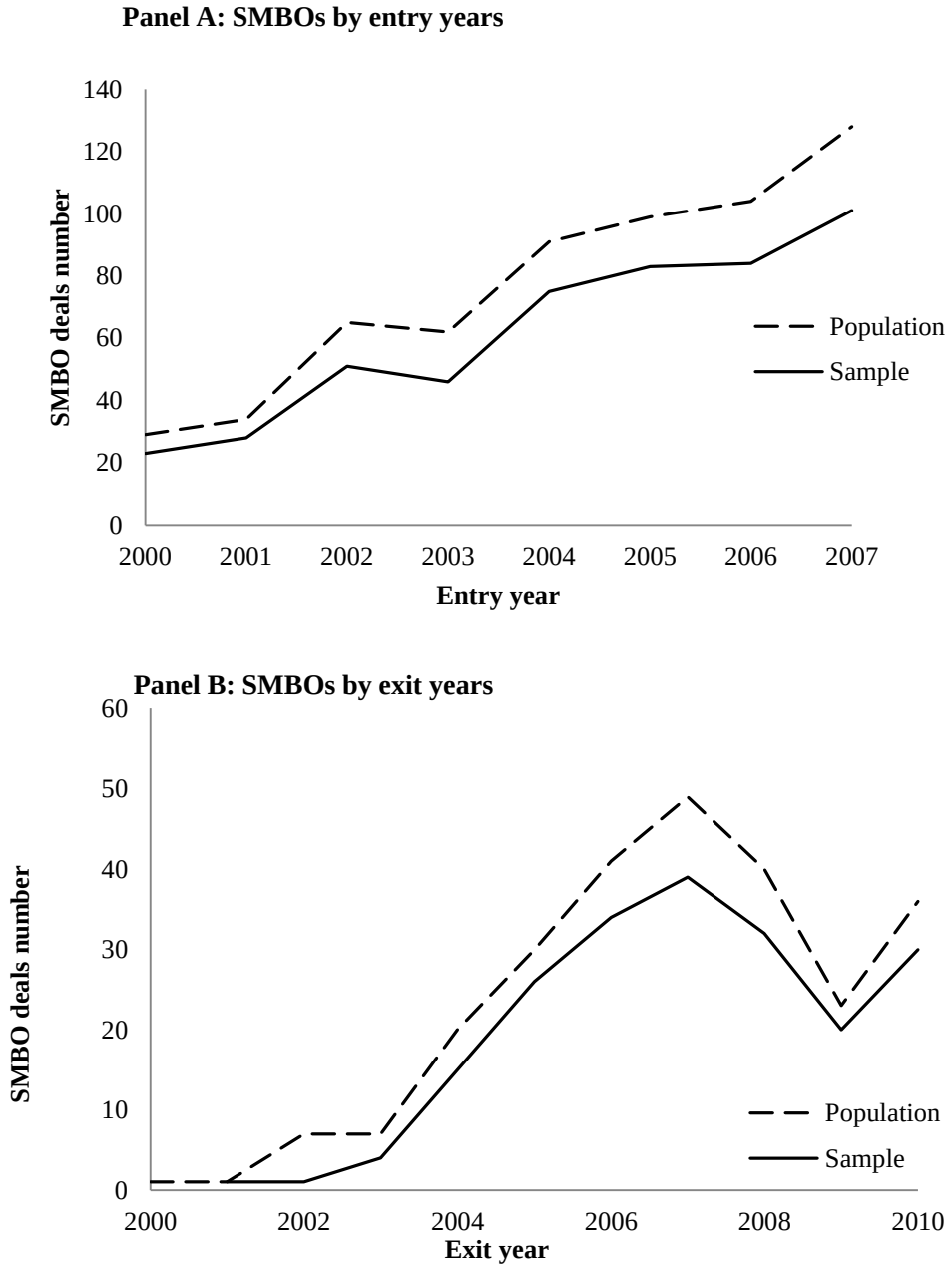

Table 2.1: Sample SMBOs

This table presents sample SMBOs in terms of PE backing, exit statuses, and exit routes from 2000 to 2010. The population is the number of UK SMBOs prior to applying any data selection criteria. The sample is the number after employing data selection criteria. Exit routes include initial public offering (IPO), tertiary management buyout (TMBO), trade sale (Sale), and receivership (Recei.).

	Population	Sample
Total number of SMBOs	612	491
PE-backed	396	323
Non-PE-backed	216	168
Numbers of Exits from SMBO	254	204
IPO	12	12
TMBO	83	69
Sale	95	82
Recei.	64	41
Still in SMBO by 31/12/2010	358	287

Table 2.2: Industry distribution

This table shows sample SMBOs' industry distribution in terms of exit statuses, exit routs, and PE backing. Exit routes are: initial public offering (IPO), tertiary management buyout (TMBO), trade sale (Sale), and receivership (Recei.). Non-exit is defined as the SMBO which does not exit by 31/12/ 2010. Reported figures in Panel A and Panel B are the proportion and the corresponding numbers of SMBOs in industry groups, respectively. Reported P-values are two samples Kolmogorov Smirnov (K-S) test for differences in industry distributions in terms of exit routs, exit statuses, and PE baking. Details of industry grouping are discussed in section 2.3.1.

Panel A:	Exit status					PE backing		Total sample
	Exit				Non-exit	PE	Non-PE	
Industry (%):	IPO	TMBO	Sale	Recei.				
1. Internet &Computers	8	3	4	2	3	3	4	3
2. Communications & Electronics	17	0	6	5	3	4	4	4
3. Business & Industrial	17	13	23	22	22	17	27	21
4. Consumer	33	25	29	20	22	27	16	23
5. Energy	0	1	0	0	2	2	1	1
6.Biotech & Healthcare	8	9	7	0	2	6	1	4
7. Business Services	17	46	27	51	44	39	45	41
8. All other	0	3	4	0	2	2	2	2
Total	100	100	100	100	100	100	100	100
% of total sample	2	14	17	8	59	66	34	100

	IPO vs. TMBO	IPO vs. Sale	IPO vs. Recei.	TMBO vs. Sale	TMBO vs. Recei.	Sale vs. Recei.	Exit vs. Non-exit	PE vs. Non-PE
K-S test P -value	0.109	0.939	0.139	0.042	0.680	0.109	0.787	0.071

Panel B:	Exit status					PE backing		Total sample
	Exit				Non-exit	PE	Non-PE	
Industry (%):	IPO	TMBO	Sale	Recei.				
1. Internet &Computers	1	2	3	1	9	9	7	16
2. Communications & Electronics	2	0	5	2	9	13	7	20
3. Business & Industrial	2	9	19	9	63	55	46	101
4. Consumer	4	17	24	8	63	88	27	115
5. Energy	0	1	0	0	6	5	1	6
6.Biotech & Healthcare	1	6	6	0	6	18	1	19
7. Business Services	2	32	22	21	126	127	76	203
8. All other	0	2	3	0	5	8	3	11
Total	12	69	82	41	287	323	168	491

Table 2.3: Sample descriptive statistics

This table presents the results of the sample descriptive statistics and Pearson correlation. Panel A reports descriptive statistics for deal characteristics. Values of descriptive statistics in terms of PE backing are median values. P-values are from the Wilcoxon rank-sum (Mann Whitney) test for differences of different variables between PE-backed and non-PE-backed SMBOs. N for *LNSIZE (ln(million GBP), 1st DURA(month), 2nd DURA(month),* and *DURATION(month)* is the number of SMBOs in the transaction years. N for *GEAR(%), MGTSHARE(%),* and *DEBTCOV(%)* is the number of firm-year observations, up to five years after SMBO transactions. Panel B presents the results of Pearson correlation of all variables used in this chapter. All variables are defined in Appendix 2.1.

Panel A: Descriptive statistics

	Full sample				PE backing(median)		
	N	mean	median	S.D.	PE	non-PE	P-Value
LNSIZE(ln(million GBP))	447	1.308	1.342	0.747	1.602	0.531	0.000
GEAR(%)	1146	1.551	0.780	2.093	0.824	0.670	0.000
MGTSHARE(%)	977	0.598	0.599	0.351	0.370	1.000	0.000
DEBTCOV(%)	725	5.025	1.434	32.060	1.358	1.649	0.192
1st DURA(month)	238	59.866	53.000	32.807	50.000	57.000	0.156
2nd DURA(month)	204	40.574	37.500	20.465	38.000	37.000	0.548
DURATION(month)	491	56.637	54.000	26.212	50.000	63.000	0.000

Panel B: Pearson correlation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
AROA(1)	1.00																
AROS(2)	0.49	1.00															
	0.00																
ASALEMP(3)	0.14***	0.07*	1.00														
	0.00	0.08															
AEMPG(4)	0.12***	0.13***	0.05	1.00													
	0.00	0.00	0.28														
ASALG(5)	0.20***	0.05	0.38***	0.61***	1.00												
	0.00	0.18	0.00	0.00													
Industry adjust. AROA(6)	0.98***	0.40***	0.28***	0.21***	0.30***	1.00											
	0.00	0.00	0.00	0.00	0.00												
Industry adjust. AROS(7)	0.41***	0.95***	0.08*	0.11**	0.05	0.36***	1.00										
	0.00	0.00	0.05	0.01	0.21	0.00											
Industry adjust. ASALEMP(8)	0.18***	0.16***	0.93***	0.01	0.35***	0.31***	0.14***	1.00									
	0.00	0.00	0.00	0.83	0.00	0.00	0.00										
Industry adjust. AEMPG(9)	0.18***	0.11**	-0.15***	0.94***	0.46***	0.11	0.09*	-0.20***	1.00								
	0.00	0.01	0.00	0.00	0.00	0.04	0.05	0.00									
Industry adjust. ASALG(10)	0.15***	-0.01	0.34***	0.50***	0.90***	0.23***	-0.01	0.34***	0.38***	1.00							
	0.00	0.90	0.00	0.00	0.00	0.00	0.80	0.00	0.00								
MGTSHARE(11)	0.13***	0.03	-0.01	0.02	-0.02	0.09*	0.01	-0.05	0.03	0.04	1.00						
	0.00	0.46	0.83	0.67	0.61	0.06	0.77	0.27	0.52	0.36							
DEBCOV(12)	-0.13***	0.09**	-0.05	-0.18***	-0.13***	-0.08**	0.12***	-0.02	-0.11**	-0.09**	-0.04	1.00					
	0.00	0.04	0.27	0.00	0.00	0.03	0.00	0.64	0.03	0.04	0.27						
GEAR(13)	-0.03	-0.04	0.06	-0.05	-0.04	-0.09*	-0.02	0.07	-0.07	-0.07	-0.18***	0.25***	1.00				
	0.38	0.31	0.13	0.23	0.31	0.05	0.59	0.11	0.12	0.11	0.00	0.00					
LNDURATION(14)	-0.06*	0.05	0.22***	0.01	-0.06	-0.10**	0.05	-0.09**	0.03	-0.06	0.19***	-0.13***	-0.11***	1.00			
	0.06	0.18	0.00	0.78	0.16	0.03	0.19	0.03	0.54	0.15	0.00	0.00	0.00				
LNSIZE(15)	-0.05	0.05	-0.02	0.01	0.04	0.02	0.06	0.11**	0.00	0.00	-0.55***	0.02	0.11***	-0.18***	1.00		
	0.12	0.16	0.60	0.86	0.30	0.72	0.12	0.01	0.97	0.95	0.00	0.61	0.00	0.00			
Crisis(16)	-0.02	0.01	-0.15***	0.01	0.05	-0.00	0.05	-0.02	-0.04	0.05	-0.04	0.03	-0.07**	-0.20***	0.11***	1.00	
	0.50	0.78	0.00	0.83	0.22	0.69	0.19	0.69	0.38	0.21	0.21	0.37	0.02	0.00	0.00		
ROA t-1(17)	-0.16***	-0.16***	0.07*	-0.12***	-0.10**	-0.09*	-0.15***	-0.13***	-0.08*	-0.07*	-0.04	-0.08*	-0.07**	0.16***	0.07***	0.00	1.00
	0.00	0.00	0.08	0.00	0.01	0.05	0.00	0.00	0.05	0.09	0.18	0.05	0.03	0.00	0.00	0.89	
PE(18)	-0.08**	-0.01	-0.07*	-0.02	0.00	-0.06	-0.02	0.08*	-0.02	-0.05	-0.68***	0.07*	0.10***	-0.13***	0.53***	0.10***	0.13***
	0.01	0.78	0.05	0.67	0.94	0.20	0.55	0.05	0.56	0.19	0.00	0.05	0.00	0.00	0.00	0.00	0.00

Table 2.4: Summary results of performance measures

This table reports summary results of various performance measures in terms of full sample and PE backing. Panel A reports the results of performance measures before SMBO (3 years). Panel B reports the results of performance measures after SMBO (5 years), respectively. Values related to PE backing are median values. N is the number of firm-year observable SMBOs for different performance measures. The performance measures are: (1) Profitability: return on assets (*ROA*) and return on sales (*ROS*); (2) Productivity (*SALEMP):* The logarithm value of inflation adjusted sales (thousand GBP) scaled by the number of employees in year t; (3) Growth ratios: employment growth (*EMPG*) and sales growth (*SALG*). Panel C are differences in mean and median values estimated by performance measures before SMBOs minus their counterparts after SMBOs. The results are based on 99% winsorized data. P-values are from the t-test for differences in the mean values and Wilcoxon rank-sum (Mann Whitney) test for differences in median values. Definitions of these performance measures are presented in Appendix 2.1.

	Full sample						PE backing(median)		
	N	Min.	mean	median	Max.	S.D.	PE	non-PE	P-Value
Panel A: Pre-SMBO									
ROA	981	-0.380	0.089	0.077	0.500	0.129	0.088	0.06	0.000
ROS	899	-1.231	0.049	0.056	0.384	0.175	0.072	0.032	0.000
SALEMP	917	1.206	2.134	2.071	4.966	0.479	2.039	2.138	0.000
EMPG	671	-0.437	0.034	0.026	0.494	0.169	0.037	0.004	0.001
SALG	654	-0.515	0.105	0.076	0.925	0.240	0.088	0.037	0.000
Panel B: Post-SMBO									
ROA	1199	-0.639	0.062	0.067	0.410	0.143	0.064	0.067	0.301
ROS	1009	-5.975	-0.010	0.054	0.856	0.685	0.068	0.042	0.000
SALEMP	880	0.241	2.171	2.102	5.021	0.504	2.068	2.198	0.000
EMPG	1052	-0.585	0.003	0.010	0.364	0.161	0.021	0.000	0.000
SALG	947	-0.750	0.051	0.047	0.936	0.251	0.060	0.018	0.000
Panel C: Pre vs Post									
	Mean	P-value	Median	P-value					
ROA	0.026	0.000	0.010	0.000					
ROS	0.059	0.012	0.001	0.834					
SALEMP	-0.037	0.115	-0.031	0.002					
EMPG	0.031	0.000	0.017	0.002					
SALG	0.055	0.000	0.029	0.000					

Table 2.5: Summary results of post-SMBO performance

This table shows the results of median values of post-SMBO abnormal performance for the full sample, from the first to the fifth year (Y 1-5) after SMBO transactions. Abnormal performance (AP_{it}) is calculated as:$AP_{it} = P_{it} - E(P_{it})$. where, P_{it} is the actual performance in year t after SMBO transactions while $E(P_{it})$ is the expected performance of the target company in year t after SMBO transactions. $E(P_{it})$ is estimated by two models: $E(P_{it}) = P_{i,t-k}$, and $E(P_{it}) = P_{i,t-k} + \Delta PI_{it}$; where, the former is 'level' model (unadjusted) and the latter is 'change' model (industry adjusted). The presented values are median values of AP_{it} in the form of performance measures as follows: (1) Profitability: abnormal return on assets (*AROA*) and abnormal return on sales (*AROS*); (2) Productivity: abnormal sales per employee (*ASALEMP)*; (3) Growth ratios: abnormal employment growth (*AEMPG*) and abnormal sales growth (*ASALG*). All results are used 99% winsorized data. The Wilcoxon signed rank test (median=0, vs. median≠0) is adopted to test the significance of abnormal performance. ***, **, *, are the significance at the 1, 5, and 10 percent levels, respectively. Definitions of these performance measures are presented in Appendix 2.1.

(# observations; # positive observations)						
		Y1	Y2	Y3	Y4	Y5
Profitability						
AROA	Unadjusted	-0.008**	-0.016***	-0.030***	-0.036***	-0.047**
		(294:137)	(255:101)	(191:69)	(151:52)	(103:36)
	Industry adjusted	-0.009**	-0.028***	-0.036***	-0.066***	-0.045*
		(287:133)	(252:91)	(187:64)	(119:36)	(74:32)
AROS	Unadjusted	0.008	-0.001	-0.004	-0.014**	-0.017**
		(236:128)	(204:101)	(153:69)	(123:50)	(91:31)
	Industry adjusted	0.007	-0.003	-0.008*	-0.005	-0.017*
		(224:122)	(194:92)	(146:58)	(90:42)	(62:24)
Productivity						
ASALEMP	Unadjusted	0.038***	0.030***	0.025***	0.022	-0.023***
		(234:159)	(199:128)	(146:88)	(125:73)	(82:35)
	Industry adjusted	-0.023**	-0.036***	-0.067***	-0.071***	-0.078**
		(195:73)	(164:56)	(122:35)	(77:24)	(35:10)
Growth ratios						
AEMPG	Unadjusted	-0.004	-0.022**	-0.039***	-0.038**	-0.056**
		(226:110)	(191:77)	(144:55)	(83:28)	(48:15)
	Industry adjusted	-0.014	-0.026*	-0.032***	-0.046*	-0.027
		(192:89)	(161:71)	(119:39)	(67:29)	(36:14)
ASALG	Unadjusted	-0.016*	-0.046***	-0.050***	-0.098***	-0.126***
		(204:94)	(177:74)	(132:50)	(73:21)	(47:11)
	Industry adjusted	0.008	-0.012	-0.041	0.011	-0.071*
		(198:101)	(173:83)	(129:57)	(73:40)	(47:18)

Table 2.6: The influence of managerial ownership and leverage on post-SMBO performance

This table reports the results of the panel regression for the influence of managerial ownership and leverage on post-SMBO performance, up to five years after SMBO transactions. Panel A uses unadjusted abnormal performance as dependent variables, while Panel B uses industry adjusted abnormal performance as dependent variables. Definitions of the variables are presented in Appendix 2.1.The results are based on 99% winsorized data. All parameters are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. Coefficients and z-statistics are presented. Industry and entry year dummies are included. N is the number of firm-year observations used for the estimation, from the first to the fifth post-SMBO years. ***, **,* are significance at the 1%, 5%, and 10% levels respectively.

Panel A: Unadjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
MGTSHARE	0.032	-0.031	0.003	0.023	0.089
	1.582	-1.329	0.125	0.503	0.928
DEBCOV	-0.000***	-0.000	-0.001***	-0.001	-0.001
	-5.145	-0.617	-3.578	-1.159	-0.796
ROA t-1	-0.355***	-0.505***	-0.206	-0.105	-0.118
	-3.671	-4.031	-1.109	-0.792	-0.566
LNDURATION	-0.018	0.076	0.038	-0.011	-0.010
	-0.533	1.425	0.296	-0.099	-0.066
LNSIZE	0.008	0.051**	-0.010	0.036	0.057
	0.864	2.274	-0.278	1.163	1.266
Crisis	-0.014	0.009	-0.002	-0.049**	-0.107***
	-1.455	0.557	-0.205	-2.388	-3.772
PE	-0.001	-0.024	0.110***	-0.024	0.029
	-0.088	-1.011	2.587	-0.571	0.445
INTERCEPT	0.076	-0.035	-0.006	0.183	0.038
	0.868	-0.214	-0.026	0.842	0.134
Year dummy	YES	YES	YES	YES	YES
Industry dummy	YES	YES	YES	YES	YES
R-square (%)	24.75	17.02	6.13	8.67	5.00
Wald Chi2	91.564***	46.097***	85.727***	37.596**	67.640***
N	619	563	502	490	486

Panel B: Industry adjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
MGTSHARE	0.027	-0.022	-0.011	0.000	0.053
	1.220	-1.105	-0.348	0.010	0.570
DEBCOV	-0.000***	-0.000	-0.001***	-0.001	-0.001
	-5.638	-0.273	-3.726	-1.187	-0.723
ROA t-1	-0.342***	-0.370***	-0.100	-0.091	-0.149
	-3.406	-4.137	-0.601	-0.743	-0.657
LNDURATION	-0.085*	0.049	-0.053	0.037	-0.076
	-1.891	1.099	-0.389	0.312	-0.457
LNSIZE	0.016	0.044**	-0.005	0.031	0.060
	1.380	2.415	-0.143	1.014	1.302
Crisis	-0.003	0.010	-0.030***	-0.060**	-0.062*
	-0.232	0.738	-3.075	-2.401	-1.902
PE	-0.004	-0.009	0.106***	-0.053	0.023
	-0.177	-0.491	2.597	-1.094	0.330
INTERCEPT	0.160	-0.080	-0.226	0.301	-0.091
	1.533	-0.617	-0.913	1.360	-0.262
Year dummy	YES	YES	YES	YES	YES
Industry dummy	YES	YES	YES	YES	YES
R-square (%)	22.86	17.64	12.50	10.25	15.56
Wald Chi2	99.367***	39.779***	485.162***	46.233***	64.576***
N	605	546	447	404	474

Table 2.7: Profitability performance based on EBITDA

This table reports the results of abnormal performance in profitability based on operating income before depreciation and amortization (*EBITDA*). Abnormal performance (AP_{it}) is calculated as: $AP_{it} = P_{it} - E(P_{it})$. where, P_{it} is the actual performance in year t after SMBO transactions . $E(P_{it})$ is the expected performance of the target company in year t after SMBO transactions. It is estimated by two models: $E(P_{it}) = P_{i,t-k}$, and $E(P_{it}) = P_{i,t-k} + \Delta PI_{it}$; where, the former is 'level' model (unadjusted) and the latter is 'change' model (industry adjusted). The presented values are median values of AP_{it}. *EBITDAA* is *EBITDA* divided by total assets at the end of the year; *EBITDAS* is *EBITDA* divided by sales. All results are used 99% winsorized data. The Wilcoxon signed rank test is employed to test the significance of abnormal performance. ***, **, *, indicate significance at the 1, 5, and 10 per cent levels, respectively.

(# observations; # positive observations)						
		Y1	Y2	Y3	Y4	Y5
AEBITDAA	Unadjusted	-0.020***	-0.027***	-0.035***	-0.048***	-0.058***
		(294:121)	(255:97)	(191:66)	(151:46)	(103:31)
	Industry adjusted	-0.021***	-0.032***	-0.039***	-0.035***	-0.041***
		(287:121)	(251:95)	(187:63)	(118:39)	(73:27)
AEBITDAS	Unadjusted	0.004	-0.005	-0.006**	-0.019***	-0.027***
		(236:128)	(204:94)	(153:64)	(123:42)	(91:28)
	Industry adjusted	0.004	-0.007	-0.009***	-0.014	-0.016*
		(224:120)	(194:88)	(145:58)	(87:36)	(57:22)

Table 2.8: Differences in post-buyout performance between SMBOs and primary MBOs

This table presents the median values of the differences of abnormal performance measures between SMBOs and primary private-to-private MBOs, up to five years after SMBO. Differences are estimated as the abnormal performance of SMBOs in year t minus the abnormal performance of primary private-to-private MBOs in year t. Panel A shows the differences of full samples. Panel B shows the differences of matched samples. Matching is based on industry, size, pre-buyout performance, and buyout year, with using propensity score matching method. All results are obtained by using 99% winsorized data. We employ the Wilcoxon rank-sum (Mann Whitney) test to test the equality of abnormal performance from the two samples. ***, **, *, indicate significance at the 1, 5, and 10 per cent levels, respectively. Definitions of abnormal performance measures are presented in Appendix 2.1.

	Y1	Y2	Y3	Y4	Y5
Panel A: Comparison of non-matched samples					
Profitability					
AROA	-0.049***	-0.053***	-0.059***	-0.134***	-0.041
AROS	-0.002	-0.008*	-0.011***	-0.020***	-0.022**
Productivity					
ASALEMP	0.020**	-0.008	-0.007	0.027*	-0.057***
Growth ratios					
AEMPG	-0.017	-0.004	-0.039***	-0.020	-0.050
ASALG	-0.021	-0.061**	-0.067***	-0.067*	-0.155***
Number of SMBOs			491		
Number of primary MBOs			348		
Panel B: Comparison of matched samples					
Profitability					
AROA	-0.067***	-0.070***	-0.082***	-0.146***	-0.052
AROS	-0.000	-0.004	-0.018***	-0.028***	-0.033*
Productivity					
ASALEMP	0.020*	-0.010	-0.022	-0.090***	-0.852***
Growth ratios					
AEMPG	-0.014	-0.015	-0.038**	-0.008	-0.110
ASALG	-0.010	-0.063	-0.089***	-0.067	-0.213***
Number of SMBOs			152		
Number of primary MBOs			152		

Table 2.9: Post-SMBO performance by exit routes

This table presents the P-values of the Wilcoxon rank-sum (Mann Whitney) test for differences in median unadjusted abnormal performance measures in the light of exit routes, up to five years after SMBO transactions. Panel A shows the comparison between exited SMBOs and non-exited SMBOs. '+' indicates that exited SMBOs outperform non-exited SMBOs; '-' indicates that exited SMBOs underperform non-exited SMBOs. Panel B shows the comparison among exited SMBOs through tertiary management buyouts (TMBOs) and exited SMBOs through IPO, trade sale, and receivership, respectively. '+' indicates that exited SMBOs through TMBOs outperform other exit types; '-' indicates that exited SMBOs through TMBOs underperform other exit types. N.A. means that the data is not applicable during the post-SMBO years. Bold numbers indicate that the differences are significant at levels of 1%, 5%, and 10%. Definitions of abnormal performance measures are presented in Appendix 2.1.

Panel A: Exited vs. Non-exited SMBOs					
	Y1	Y2	Y3	Y4	Y5
AROA	-0.607	-0.446	-0.818	+0.445	-0.608
AROS	-0.492	+0.875	-0.469	-0.932	-0.485
ASALEMP	-0.379	-0.645	-0.641	+0.528	+0.628
AEMPG	-0.912	-0.991	+0.177	+0.626	-0.903
ASALG	+0.107	+0.870	+0.540	-0.747	-0.135
Panel B: performance in post-SMBOS years, grouped by exit routes					
	Y1	Y2	Y3	Y4	Y5
TMBO vs. IPO					
AROA	-0.788	-0.472	+0.828	-0.643	n.a.
AROS	+0.883	-0.697	-1.000	-0.885	n.a.
ASALEMP	+0.453	+0.688	-0.588	n.a.	n.a.
AEMPG	**-0.078**	**-0.095**	n.a.	n.a.	n.a.
ASALG	-0.687	**-0.096**	n.a.	n.a.	n.a.
TMBO vs. Trade sales					
AROA	-0.451	+0.733	+0.191	-0.622	-0.317
AROS	-0.778	+0.671	**+0.059**	+0.621	-0.423
ASALEMP	**-0.017**	-0.106	**-0.054**	**-0.050**	+0.394
AEMPG	-0.709	-0.235	-0.803	-0.308	-0.165
ASALG	+0.592	-0.936	+0.548	+0.571	-0.157
TMBO vs. Receivership					
AROA	+0.194	-0.628	-0.263	-0.022	-0.116
AROS	**+0.083**	+0.663	+0.779	-0.712	-0.514
ASALEMP	+0.851	+0.517	+0.617	-0.762	+0.348
AEMPG	+0.231	+0.580	-0.780	+1.000	+0.559
ASALG	**+0.017**	-0.477	-0.896	-0.486	-1.000

Table 2.10: 'Early' vs. 'late' exits

This table presents unadjusted and industry adjusted median values of abnormal performance measures for 'early' and 'late' exit subsamples, from the first to fifth year (Y1-5) after SMBO transactions. The 'early' exit subsample is defined as that the primaries' holding period is shorter than 2 years. The 'late' exit subsample is defined as that the primaries' holding period is equal to or longer than 4 years. Unadjusted abnormal performance is estimated based on 'level' model. Industry adjusted abnormal performance is estimated based on 'change' model. All results use 99% winsorized data. The Wilcoxon signed rank test is for testing the significance of abnormal performance. ***, **, *, are significance at the 1%, 5%, and 10% levels, respectively. Definitions of abnormal performance measures are presented in Appendix 2.1.

(# observations; # positive observations)							
			Y1	Y2	Y3	Y4	Y5
Early	Profitability						
	AROA	Unadjusted	0.002	0.053	0.031	0.042	-0.087
			(20:10)	(16:10)	(10:6)	(6:5)	(7:1)
		Industry adjusted	0.011	0.051	0.004	-0.000	0.044
			(20:11)	(16:10)	(10:5)	(4:2)	(2:1)
	AROS	Unadjusted	0.021	0.003	0.007	0.028	-0.037
			(16:10)	(14:7)	(10:5)	(5:4)	(7:1)
		Industry adjusted	0.026	0.013	-0.001	-0.000	0.014
			(16:11)	(14:8)	(10:5)	(4:2)	(2:1)
	Productivity						
	ASALEMP	Unadjusted	0.093*	0.043	0.047	0.180*	-1.855*
			(16:11)	(14:8)	(10:6)	(4:4)	(5:1)
		Industry adjusted	0.039	-0.013	-0.061	-0.004	-0.05
			(15:9)	(13:4)	(10:4)	(4:2)	(1:0)
	Growth ratios						
	AEMPG	Unadjusted	-0.019	-0.035	-0.09	0.005	-0.074
			(13:6)	(12:5)	(9:6)	(3:2)	(2:0)
		Industry adjusted	-0.096	-0.124	-0.146	-0.074	-0.133
			(12:4)	(11:5)	(8:2)	(2:0)	(2:0)
	ASALG	Unadjusted	-0.027	-0.05	-0.102	-0.102	-0.152
			(13:6)	(12:4)	(9:2)	(3:0)	(2:0)
		Industry adjusted	-0.019	-0.011	-0.093	-0.061	-0.118
			(13:6)	(12:5)	(9:2)	(3:1)	(2:0)

(Continued)

(# observations; # positive observations)

			Y1	Y2	Y3	Y4	Y5
Late	Profitability						
	AROA	Unadjusted	0.001	-0.014**	-0.037***	-0.053***	-0.034*
			(111:56)	(102:45)	(74:25)	(56:18)	(38:15)
		Industry adjusted	-0.003	-0.039***	-0.047***	-0.100***	-0.021
			(107:52)	(100:37)	(77:23)	(44:11)	(28:13)
	AROS	Unadjusted	0.019**	0.014	0.003	-0.004	-0.013
			(81:51)	(74:43)	(55:32)	(40:19)	(34:14)
		Industry adjusted	0.018*	0.000	-0.005	0.016	-0.026
			(78:48)	(72:36)	(53:26)	(28:17)	(23:8)
	Productivity						
	ASALEMP	Unadjusted	0.047***	0.040***	0.025**	0.011	-0.023*
			(82:59)	(73:46)	(50:30)	(42:22)	(27:10)
		Industry adjusted	-0.024*	-0.032**	-0.053**	-0.037	-0.114
			(70:27)	(62:22)	(44:15)	(25:10)	(11:4)
	Growth ratios						
	AEMPG	Unadjusted	0.006	-0.012	-0.056**	-0.006	0.010
			(87:45)	(78:33)	(59:20)	(33:14)	(22:11)
		Industry adjusted	0.001	-0.012	-0.051**	-0.037	0.005
			(74:37)	(67:30)	(48:14)	(25:11)	(15:8)
	ASALG	Unadjusted	0.002	-0.027	0.005	-0.040	-0.144**
			(76:41)	(68:33)	(50:26)	(24:9)	(17:3)
		Industry adjusted	0.01	0.006	-0.024	0.034	-0.111*
			(73:38)	(67:34)	(49:24)	(24:13)	(17:4)

Table 2.11: PE-backed vs. Non-PE-backed SMBOs

This table displays the P-values of the Wilcoxon rank-sum (Mann Whitney) test for the differences of median values of abnormal performance measures between PE-backed and non-PE-backed SMBOs, up to five years after SMBO transactions. '+' indicates that PE-backed SMBOs outperform non-PE-backed SMBOs; '-' indicates that PE-backed SMBOs underperform non-PE-backed SMBOs. Unadjusted abnormal performance is estimated based on 'level' model. Industry adjusted abnormal performance is estimated based on 'change' model. Bold numbers indicate that the differences are significant at levels of 1%, 5%, and 10%. Definitions of abnormal performance measures are presented in Appendix 2.1.

		YI	Y2	Y3	Y4	Y5
Profitability						
AROA	Unadjusted	-0.365	-0.104	**-0.022**	-0.115	**-0.000**
	Industry adjusted	-0.748	+0.529	**-0.026**	-0.191	**- 0.018**
AROS	Unadjusted	+0.633	+0.596	+0.294	+0.468	**-0.011**
	Industry adjusted	+0.455	+ 0.247	-0.750	+0.184	+0.388
Productivity						
ASALEMP	Unadjusted	**+0.029**	+0.123	+0.309	-0.736	**-0.000**
	Industry adjusted	+**0.076**	**+ 0.060**	+**0.042**	+0.161	-0.225
Growth ratios						
AEMPG	Unadjusted	+0.185	-0.973	-0.271	+0.970	+0.635
	Industry adjusted	+0.280	-0.708	- 0.212	-0.289	+0.496
ASALG	Unadjusted	+0.294	-0.232	-0.329	-0.129	-0.533
	Industry adjusted	+ 0.814	-0.437	**- 0.066**	**- 0.012**	- 0.611

Table 2.12: Alternative measure of leverage

This table reports the results of the panel regression for the influence of governance mechanisms on post-SMBO performance, up to five years after SMBO transactions, with an alternative measure of leverage (*GEAR*). Definitions of the variables are presented in Appendix 2.1. The dependent variables are unadjusted abnormal performance measures. The results are based on 99% winsorized data. All parameters are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. Coefficients and z-statistics are presented. Industry and entry year dummies are included. N is number of firm-year observations used for the estimation, from the first to the fifth post-SMBO years. ***, **,* are significance at the 1%, 5%, and 10% levels, respectively.

	AROA	AROS	ASALEMP	AEMPG	ASALG
MGTSHARE	0.023	-0.039*	0.021	-0.036	0.104
	0.795	-1.845	0.911	-0.506	1.148
GEAR	-0.017**	-0.012***	0.003	0.000	-0.001
	-2.321	-3.528	0.545	0.007	-0.088
ROA t-1	-0.617***	-0.473***	-0.339	-0.264	-0.372
	-3.913	-3.787	-1.339	-1.429	-1.258
LNDURATION	-0.068	0.092*	0.029	0.150	0.093
	-0.777	1.675	0.195	0.973	0.608
LNSIZE	0.021	0.042*	0.027	0.022	0.075
	1.000	1.812	0.696	0.562	1.595
Crisis	-0.019	-0.002	0.005	-0.022	-0.094***
	-1.625	-0.168	0.419	-0.654	-2.945
PE	-0.050	-0.028	0.063	-0.021	-0.002
	-1.151	-1.155	1.242	-0.400	-0.036
INTERCEPT	-1.038	-0.032	0.008	-0.003	-0.092
	-0.987	-0.195	0.031	-0.011	-0.323
Year dummy	YES	YES	YES	YES	YES
Industry dummy	YES	YES	YES	YES	YES
R-square	13.28	12.95	6.11	4.43	4.50
Wald Chi2	47.520***	43.251***	69.405***	42.422***	70.688***
N	740	611	548	563	531

Table 2.13: The influence of managerial ownership and leverage on post-SMBO performance-corrected for sample selection bias

This table reports the results of the panel regression for the influence of managerial ownership and leverage on post-SMBO performance, corrected for sample selection bias. Panel A reports the results of pooled Probit regression with the robust variance estimate for the profitability of receiving PE backing by the sample SMBOs. The Probit regression is converged after three iterations. Panel B is the results of panel regression by using unadjusted abnormal performance measures as dependent variables. *Lambda* is fitted probability of receiving PE backing which is estimated from the Probit regression. The results are based on 99% winsorized data. All parameters are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. Coefficients and z-statistics are presented. Industry and year dummies are included. N is number of observations used for the estimation, from the first to the fifth post-SMBO year. ***, **,* are significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix 2.1.

Panel A: 1st Step: Probit regression

Independent variables	Coefficient
BSERVICES	-0.234***
LNSIZE	1.298***
ROA t-1	0.626**
INTERCEPT	-0.945***
Log likelihood	-770.289
Pseudo R^2 (%)	27.89
Wald Chi ^{2}	446.46***
N	1725

Panel B: 2nd Step: Panel regression

	AROA	AROS	ASALEMP	AEMPG	ASALG
MGTSHARE	0.030	-0.031	0.004	0.024	0.090
	1.470	-1.341	0.168	0.523	0.947
DEBCOV	-0.000***	-0.000	-0.001***	-0.001	-0.001
	-5.226	-0.627	-3.668	-1.156	-0.794
ROA t-1	-0.392***	-0.514***	-0.135	-0.065	-0.100
	-4.008	-3.842	-0.599	-0.492	-0.445
LNDURATION	-0.011	0.077	0.016	-0.020	-0.014
	-0.332	1.456	0.117	-0.185	-0.093
LNSIZE	-0.036	0.040	0.065	0.083	0.079
	-1.476	0.562	0.728	0.920	0.727
Crisis	-0.014	0.009	-0.002	-0.049*	-0.108***
	-1.458	0.556	-0.202	-2.371	-3.768
PE	-0.003	-0.025	0.113**	-0.022	0.030
	-0.205	-1.025	2.572	-0.520	0.469
Lambda	-0.074*	-0.018	0.133	0.083	0.039
	-1.850	-0.165	0.843	0.599	0.202
INTERCEPT	0.158	-0.015	-0.131	0.096	-0.001
	1.531	-0.071	-0.538	0.358	-0.002
Year dummy	YES	YES	YES	YES	YES
Industry dummy	YES	YES	YES	YES	YES
R-square (%)	25.28	16.95	7.18	8.87	5.05
Wald Chi2	94.637***	46.515***	84.522***	37.885***	70.437***
N	619	563	502	490	486

Appendix 2.1: Definitions of variables

Description	Variable	Definition
	Performance measures	
Profitability		
Return on assets	*ROA*	Earnings before interests and taxes (*EBIT*) scaled by total assets in year t.
	EBITDAA	Earnings before interests, taxes, depreciation, and amortization (*EBITDA*) scaled by total assets in year t.
Abnormal return on assets	*AROA*	The difference between actual *ROA* in year t and expected *ROA* in year t.
	AEBITDAA	The difference between actual *EBITDAA* in year t and expected *EBITDAA* in year t.
Return on sales	*ROS*	Earnings before interests and taxes (*EBIT*) scaled by total sales in year t.
	EBITDAS	Earnings before interests, taxes, depreciation, and amortization (*EBITDA*) scaled by total sales. in year
Abnormal return on sales	*AROS*	The difference between actual *ROS* in year t and expected *ROS* in year t.
	AEBITDAS	The difference between actual *EBITDAS* in year t and expected *EBITDAS* in year t.
Productivity		
Sales efficiency	*SALEMP*	The logarithm value of inflation adjusted sales (thousand GBP) scaled by the number of employees in year t.
Abnormal sales efficiency	*ASALEMP*	The difference between actual *SALEMP* in year t and expected *SALEMP* in year t.
Growth ratios		
Employment growth	*EMPG*	The difference between the numbers of employees in year t and year t-1 scaled by the average value of the numbers of employees in year t and year t-1.
Abnormal employment growth	*AEMPG*	The difference between actual *EMPG* in year t and expected *EMPG* in year t.
Sales growth	*SALG*	The difference between sales in year t and year t-1 scaled by average of sale in year t and year t-1.
Abnormal sales growth	*ASALG*	The difference between actual *SALG* in year t and expected *SALG* in year t.
	Determinants of performance	
Managerial ownership		
Management share	*MGTSHARE*	The percentage of target company's common equity contributed by the management in year t.
Leverage		

(Continue)

Debt coverage	*DEBTCOV*	The amount of long term and shot term debt divided by *EBITDA* in year t.
Gearing	*GEAR*	The sum of long term and shot term debt divided by the total equity in year t.
	Determinants of PE backing and control variables	
PE backing		
PE-backed	*PE*	A dummy variable which equals 1 if SMBO is backed by PE firms and 0 otherwise.
Control variables		
Companies' size	*SIZE*	The SMBO deal value (£ million).
	LNSIZE	The logarithm value of *SIZE*.
Companies' industry	*BSERVICES*	A dummy variable which equals 1 if the SMBO is from Business Service Industry and 0 otherwise.
Financial crisis	*Crisis*	A dummy variable which equals 1 for observations from 2008, 2009, and 2010 (the financial crisis years) and 0 otherwise.
Lambda	*Lambda*	The fitted probability of receiving PE backing, estimated by equation 5.
Pre-SMBO performance	*ROA t-1*	The performance ratio in the form of *ROA* in year preceding the SMBO.
The longevity of buyout	*1st DURA*	*1st DURA* indicates the number of months from the primary buyout date to the SMBO date.
	2nd DURA	The number of months from the SMBO date to the exit date if the SMBO was exited.
	DURATION	The number of months from the SMBO date to the exit date if the SMBO was exited or the number of months from the SMBO date to the last date (31/12/2010) if the SMBO was not exited.
	LNDURATION	The logarithm value of *DURATION*

Appendix 2.2: Fixed-effects regression

This table presents the results of fixed-effects panel regression for the influence of managerial ownership and leverage on post-SMBO performance, up to five years after SMBO transactions. The results are based on 99% winsorized data. All parameters are estimated by a fixed-effects model with robust standard error and omitted collinear covariates. P-values for F test are for probability >F. Coefficients and z-statistics are presented. N is number of observations used for the estimation, from the first to the fifth post-SMBOS year. ***, **,* are significance at the 1%, 5%, and 10% levels, respectively. Definitions of the variables are presented in Appendix 2.1.

	AROA	AROS	ASALEMP	AEMPG	ASALG
MGTSHARE	0.062*[32]	-0.012	0.025	-0.019	0.174
	1.968	-0.362	0.558	-0.160	0.931
DEBCOV	-0.000**	-0.000	-0.001***	-0.003***	-0.002**
	-2.080	-1.522	-3.357	-4.196	-2.598
ROA t-1	-	-	-	-	-
	-	-	-	-	-
LNDURATION	-	-	-	-	-
	-	-	-	-	-
LNSIZE	-	-	-	-	-
	-	-	-	-	-
Crisis	-0.014**	0.009	-0.003	-0.045*	-0.107***
	-2.064	1.260	-0.361	-1.779	-3.116
PE	-	-	-	-	-
	-	-	-	-	-
INTERCEPT	-0.029	0.037*	0.039	0.024	-0.109
	-1.420	1.701	1.315	0.312	-0.922
Year dummy	-	-	-	-	-
Industry dummy	-	-	-	-	-
R-square (%)	0.86	0.07	0.08	3.74	0.81
F test	4.39***	1.29	4.03***	7.18***	6.07***
N	619	563	502	490	486

[32] The significance at 1% level is because of deleting PE-backed dummy.

Appendix 2.3: The influence of managerial ownership and leverage on post-SMBO performance- without control variables

This table reports the results of the panel regression for the influence of managerial ownership and leverage on post-SMBO performance, without control variables. We use unadjusted abnormal performance measures as dependent variables. Definitions of the variables are presented in Appendix 2.1.The results are based on 99% winsorized data. All parameters are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. P-values for the Wald test (Wald Chi ^{2}) is for probability > Chi ^{2}. Coefficients and z-statistics are presented. Industry and year dummies are included. N is number of observations used for the estimation, from the first to the fifth post-SMBOS year. ***, **,* are significance at the 1%, 5%, and 10% levels respectively.

	AROA	AROS	ASALEMP	AEMPG	ASALG
MGTSHARE	0.043**	-0.030	-0.022	0.017	0.004
	2.358	-1.532	-0.953	0.475	0.063
DEBCOV	-0.000***	0.000	-0.001***	-0.001	-0.001
	-4.943	-0.579	-3.622	-1.186	-0.813
ROA t-1	-	-	-	-	-
	-	-	-	-	-
LNDURATION	-	-	-	-	-
	-	-	-	-	-
LNSIZE	-	-	-	-	-
	-	-	-	-	-
Crisis	-	-	-	-	-
	-	-	-	-	-
PE	-	-	-	-	-
	-	-	-	-	-
INTERCEPT	0.011	0.100	0.131*	0.155**	0.104
	0.177	1.117	1.933	2.298	0.707
Year dummy	YES	YES	YES	YES	YES
Industry dummy	YES	YES	YES	YES	YES
R-square (%)	7.64	4.61	2.57	6.75	3.09
Wald Chi2	57.820***	29.313**	39.426***	29.568**	29.080**
N	619	563	502	490	486

Appendix 2.4: 'Middle' exits

This table presents unadjusted and industry adjusted median values of abnormal performance measures for 'middle' exit subsamples, from the first to fifth year (Y1-5) after SMBO transactions. The 'middle' exit subsample is defined as that the primaries' holding period is shorter than 4 years but lager than and equal to 2 years. Unadjusted abnormal performance is estimated based on 'level' model. Industry adjusted abnormal performance is estimated based on 'change' model. All results use 99% winsorized data. The Wilcoxon signed rank test is for testing the significance of abnormal performance. ***, **, *, are significance at the 1%, 5%, and 10% levels, respectively. Definitions of abnormal performance measures are presented in Appendix 2.1.

(# observations; # positive observations)							
			Y1	Y2	Y3	Y4	Y5
Middle	Profitability						
	AROA	Unadjusted	-0.018*	-0.038***	-0.031**	-0.056***	-0.119***
			(75:32)	(65:18)	(49:17)	(39:13)	(15:2)
		Industry adjusted	-0.024	-0.037	-0.029	-0.059	-0.138*
			(74:28)	(65:24)	(48:13)	(29:9)	(11:2)
	AROS	Unadjusted	0.009	-0.005	-0.004	-0.019**	-0.025***
			(61:31)	(55:24)	(40:15)	(31:11)	(13:1)
		Industry adjusted	-0.002	-0.02	-0.010**	-0.018	-0.027
			(59:20)	(54:14)	(39:9)	(22:7)	(9:1)
	Productivity						
	ASALEMP	Unadjusted	0.036**	0.023*	0.019	0.02	-0.001
			(58:39)	(50:32)	(39:22)	(29:17)	(9:4)
		Industry adjusted	-0.022	-0.047	-0.052	-0.044	-0.078
			(53:9)	(44:4)	(34:4)	(18:2)	(5:1)
	Growth ratios						
	AEMPG	Unadjusted	0.001	-0.054**	-0.060***	-0.134**	-0.129
			(60:30)	(52:17)	(39:12)	(20:4)	(7:1)
		Industry adjusted	-0.016	-0.057**	-0.038**	-0.194	0.024
			(51:24)	(44:15)	(35:10)	(18:6)	(5:3)
	ASALG	Unadjusted	-0.038	-0.066**	-0.062***	-0.120*	-0.126
			(56:24)	(50:15)	(36:10)	(19:5)	(7:0)
		Industry adjusted	0.007	-0.045	-0.024	-0.017	0.031
			(56:28)	(50:22)	(36:16)	(19:9)	(7:4)

CHAPTER 3

INSIDE SMBOS' BOARDS

3.1 Introduction

The literature suggests that buyouts enhance corporate governance via changes to the boards of directors and management (Cumming et al., 2007; Acharya et al. 2013) and via leverage and alignment of managerial and shareholder incentives (Jensen, 1989; Kaplan, 1989a). In a SMBO, the initial (primary) buyout is acquired by a new set of PE financiers and/or management, together with new borrowings. In 2012, the PE market experienced an increase in SMBOs, accounting for upwards of 18 per cent of deal volume and 47 per cent of deal value in Europe (e.g. Wang, 2012). Despite their increasing popularity, and the different managerial and governance processes in SMBOs compared to traditional buyouts (Siegel et al., 2011), there is paucity of research on SMBO corporate governance and the role of boards in particular.

Studying SMBOs as a distinct group has potential to advance understanding of several issues related to corporate boards. As SMBOs represent both an exit route from primary buyout structures and a new buyout form, they shed new light on the debate about buyouts as a long term organizational form (Wright et al., 1995; Strömberg, 2008; Jelic, 2011). SMBOs suggest that the nature of the buyout form may need to change to ensure longevity and along with it the board expertise to deliver future performance (Cumming et al., 2007). For example, SMBOs typically involve the replacement of existing CEOs/CFOs, and changes to board membership, yet companies remain in private ownership (i.e. in a buyout form) instead of going public (i.e. IPO). SMBOs therefore provide a novel context to examine CEO and boardroom succession since they do not involve transition to a public ownership form.

Recent literature provides mixed evidence on the post-SMBO performance of target companies. Nevertheless, what drives the post-SMBO operating performance of target companies is still a puzzle. Chapter 2 reports the lack of a statistically significant relationship between high leverage and managerial ownership and the operating performance of target companies. In this chapter, we examine the importance of the board of directors for the performance of SMBOs.

Other than the core role of boards in company operational processes, the dual function of boards consists in monitoring and advisory (or enterprising and service) functions, which also offer the possibility of success in SMBOs. The monitoring function aims to eliminate agency problems while advisory functions affiliate the operational strategies. As we discussed in the literature review chapter, the "traditional" buyout literature emphasizes the importance of agency problems (e.g. Jensen's (1989) free cash flow hypothesis) and bypasses other possible entrepreneurial advantages of buyouts (based on the strategic entrepreneurship perspective). Given the nature of SMBOs, existing agency costs have already been reduced. This is the reason why these traditional value creation mechanisms become invalid. Under such circumstances, the entrepreneurial advantages of buyouts should emerge. In particular, the advisory function of the board dominates the monitoring function, as along with the ownership transition new blood is injected into the board of directors. For instance, an existing CEO/CFO may be replaced to introduce more entrepreneurial managers. New and more PE is represented on the board to advise the entrepreneurial activities. Hence, it is plausible to investigate the role of the board of directors in SMBOs, especially its relationship with post-SMBO growth performance.

This chapter represents one of the first studies to investigate the impact of the board of directors on post-SMBO performance. We employ the same variables as suggested in the

board literature to proxy for the quality of boards (monitoring and advisory functions). Although some of these variables treat the effects of the monitoring and advisory functions as a whole, in a private company scenario the monitoring function may fade away. On the other hand, from the strategic entrepreneurship perspective, we use growth performance to measure the entrepreneurial activities. A high quality advisory function may promote the opportunity- and advantage-seeking abilities of the companies. As a consequence, improvements in performance may not be reflected initially in profitability, but still create company value through growth improvement.

We firstly document the changes in board size, changes to the top management (CEO/CFO), the appointment of independent outside directors and PE directors, and insider directors' skills before and after SMBO transactions. Then we investigate whether these changes exert an influence on post-SMBO performance. We extend the dataset in Chapter 2 by manually collecting board related data, resulting in 262 UK SMBOs completed from 2000 to 2007. To the best of our knowledge, this dataset is the most comprehensive dataset on SMBOs' boards. We utilize panel regression rather than the commonly used OLS method. Heckman two-stage model and dynamic GMM panel model are considered to check for potential sample selection bias and the endogeneity issue. The test-down method is also conducted to test the necessity of our tested independent variables and the multicollinearity among independent variables.

Our study extends the current literature in several areas. First, previous studies on corporate governance in buyouts almost exclusively examine large PE-backed or PTP buyouts (e.g. Acharya et al., 2013; Cornelli and Karakas, 2013). However, these buyouts tend to only account for a small proportion of overall buyout transactions (Cumming et al., 2007; Strömberg 2008; Jelic and Wright, 2011). Furthermore, the role and focus of boards

in PTP buyouts tends to be different from those in smaller private-to-private transactions. We contribute the literature by examining boards in private-to-private buyouts (e.g. SMBOs) that has hitherto been neglected. Second, we examine both PE-backed and non-PE-backed SMBOs. Without PE backing, the management teams in non-PE-backed buyouts lose the advice (and monitoring) offered by PE firms. It is, therefore, important to compare the importance of boards in PE-backed and non-PE-backed buyouts. Third, given that SMBOs typically change boards and top management, while remaining in private ownership (i.e. in a buyout structure), we are able to examine the direct effects of changes in board characteristics (e.g. director skills) on performance. Fourth, we make more general contributions to the corporate governance literature by extending the understanding of the heterogeneity of boards in private companies, in contrast to the great body of existing research that focuses on boards in publicly listed corporations. Fifth, portfolio company level performance data provides richer performance metrics compared to PE fund/firm level data (e.g. IRR and multiples). Furthermore, whilst previous studies examine only profitability (Yermack, 1996; Eisenberg et al., 1998; Wintoki et al., 2012), our sample allows examination of the links between board characteristics and the different aspects of the performance (e.g. sales growth, profitability, productivity, employment growth). Finally, we shed more light on the current debate regarding the reasons for the recent popularity of SMBOs and their benefits for investors (i.e. general and limited partners) and portfolio companies (i.e. managers and shareholders).

The remainder of this chapter is structured as follows. Section 3.2 specifies the tested hypotheses, followed by section 3.3 that presents sample selection and data description. Section 3.4 analyses the main empirical results. Section 3.5 checks the robustness and presents further analysis. Section 3.6 concludes this chapter.

3.2 Hypotheses development

According to agency theory, the superiority of buyout organization, to a great extent, is rooted in high leverage, enhanced managerial incentive and the PE firm's governance monitoring and intervention (e.g. Acharya et al., 2013; Gong and Wu, 2011; Cornelli and Karakas, 2013; Jensen, 1989; Kaplan, 1989a; Guo et al., 2009). Via the primary buyout phase, the benefits from eliminating agency issues have already been achieved by the first round investors (Wright et al., 2009b). SMBOs continue the buyout organizational form, implying that eliminating agency issues should not be the main way in which the investors can achieve performance improvement. The improved monitoring function of the board in the secondary phase, albeit demanded by shareholders, may not be as important as in the primary phase. Moreover, the management entrenchment issues and loosened PE firms control caused by increasing managerial ownership may lead to worse post-SMBO performance. However, the current mixed evidence on post-SMBO performance, especially the outperformance evidence (Wang, 2012; Achleitner and Figge, 2014), reveals the drawbacks of agency theory.

The strategic entrepreneurship perspective (or resource-based view), as we discussed in the literature review chapter, may be a more useful approach in SMBOs, which can also support the advisory function of the board. The strategic entrepreneurship perspective, involves opportunity- and advantage-seeking behaviors (Ireland et al., 2003). This perspective assumes that opportunity- and advantage-seeking behaviors based on resource heterogeneity and immobility create a competitive advantage (Priem and Butler, 2001), so that they can lead to performance generation by exploiting growth opportunities (Ireland et al., 2003). As argued by Meuleman et al. (2009), in the buyout context, the heterogeneity and immobility of resources are related to the idiosyncratic knowledge, skills, experience,

and capabilities of existing managers, PE firms, and the specialist expertise of PE firms. Not only do buyouts use strong governance to motivate the management to utilize these resources (Wright et al., 2009a), they also employ heterogeneous resources from PE firms and their experts.

Given the achievement of the optimal monitoring function of the board and management incentive in the primary buyout, the breakthrough for SMBOs may be the enhancement of the advisory function of the board. There are two reasons. First, most of SMBOs are small-medium-sized companies which may be in the expansion phases. The role of the board, thus, may be changed as SMBOs develop over their life-cycle, as suggested by Filatotchev and Wright (2005). Second, as is the nature of SMBOs, the main difference between SMBOs and primary buyouts in corporate governance could be the board of directors. The transition in ownership could result in substantial changes in board composition. According to the strategic entrepreneurship perspective, there is heterogeneity of directors' knowledge, skills, experience, capabilities, and resources. The investors could replace inefficient directors with directors who possess knowledge, skills, experience, and capabilities that are more suitable to the SMBO phase to facilitate performance improvement through pursuit of growth opportunities. The resources and capabilities required by SMBOs may be from PE directors (Dimov and Shepherd, 2005; Meuleman et al, 2009), new top management, and/or motivated inside employees, especially influential inside directors (Meuleman et al, 2009).

3.2.1 Board size

In the literature review, we discussed the mixed evidence on the relationship between operating performance and board size. Buyout deals do not usually receive the optimal board size of seven to nine directors as recommended by Jensen (1993) and Lipton

and Lorsch (1992). Hence, we argue here that SMBOs may adjust the board size to some extent to achieve the optimal board size to improve company performance. Especially when the company is in an expansion phase, the investors (e.g. PE firms) could employ more outsider directors and/or inside directors to help growth, so the board size will increase and post-SMBO performance will be better. Thus, we expect,

Hypothesis 1: Board size of SMBO is positively associated to post-SMBO performance.

3.2.2 PE specialists on board

Incoming PE firms in SMBOs are likely to appoint their representatives specialized in monitoring (Jenter and Kanaan, 2011) and advising (Politis and Landstrom, 2002**)** as board members. New PE specialists are particularly important when buyouts performed poorly during the primary stage (Cumming and MacIntosh, 2003). For example, Chahine and Goergen (2011) report that venture capital firms are more likely to be on the board of IPOs with reported losses in the year prior to the IPO. The monitoring and advisory expertise of PE specialists will likely focus on turning around firms that under-performed as primary buyouts through active board involvement focused on identifying and closing poorly performing areas, improving the efficiency of operations, and reinvigorating areas with growth potential. Hence,

Hypothesis 2: The fraction of PE-related directors is positively related to post-SMBO performance.

3.2.3 Independent outside directors

Independent outside directors do not share the same role in private companies as in public companies. For example, the advisory function of independent outside directors is more important in private (i.e. SMBO) than in public companies. Due to PE involvement,

monitoring executive managers is not the focus of independent outside directors in private companies.[33] This is because independent outside directors are usually nominated by the outside shareholders (usually the minority shareholders). However, there are few/no outside shareholders other than PE firms in SMBOs. Obviously, PE firms do not need to recruit additional independent outside directors to improve monitoring. Second, the monitoring function of boards in private companies is not as important as that in public companies. Therefore, we argue that the nomination of independent outside directors is undertaken with the aim of obtaining professional advice from these experts, academics, or entrepreneurs. This advice might improve SMBOs' performance.

Hypothesis 3: The fraction of independent outside directors is positively related to post-SMBO performance.

3.2.4 Changing top managers

Changing the top managers (CEO and/or CFO) is also a crucial tool often used by PE firms (Wright, et al., 2009a). New boards are in better position to change the CEO and/or CFO especially if buyouts are facing difficulties (e.g. Cornelli and Karakas, 2013; Acharya et al., 2013; Gong and Wu, 2011; Kaplan and Minton, 2012; Guo et al., 2011).

The majority of SMBOs are still PE owned so that the same PE model may continuously be applied. When companies underperform before SMBO transactions, the ineffective CEO and/or CFO may be replaced with a more experienced CEO and/or CFO capable of executing the performance improvement plan. With respect to the non-PE-backed SMBOs, changing the CEO and/or CFO may still happen when the previous CEO and/or CFO retire or leave the position for other reasons. The newly nominated CEO and/or CFO might bring in new expertise to help improve the companies' performance. Therefore,

[33] Unlike public companies, nominating independent outside director is not compulsory in SMBOs.

Hypothesis 4: Changing CEO/CFO is positively related to post-SMBO performance.

3.2.5 Inside directors' skills [34]

Given the importance of the advisory function of the board, it is important to examine the impact of inside directors' skills on post-SMBO performance. We use independent outside directorships as a proxy for inside directors' skills to identify potential crucial variety amid inside directors.[35] Hence,

Hypotheses 5: SMBO with insider directors with independent outside directorship is positively associated to the post-SMBO performance.

3.3 Sample selection and data description

3.3.1 Data collection

Buyout organizations have a complex ownership structure, with several layers of companies. For instance, in some cases, the target company in both primary and secondary buyouts is wholly owned by a new company which is usually created as 'empty shell' company at the time of the buyout(s). The management team and PE firms therefore hold the shares of the 'empty shell' company. In other cases, there are several layers of new created companies at the transaction time or in the following years, which cause the ownership structures to change over time. The management team and PE firms therefore also hold the shares of the ultimate holding company. Therefore, we establish the ownership structure of target companies from 3 years before to 5 years after SMBO transactions using the approach from Cornelli and Karakas (2013), by using FAME and annual returns.[36]

We manually collected data of the boards, according to the ownership structure,

[34] Inside directors are defined as full time employees of the company.
[35] The same variable was used in previous literature, e.g. Masulis and Mobbs (2011).
[36] UK companies are required to offer the name lists of board of directors and shareholders in annual returns every year.

from https://www.duedil.com/, annual returns, annual accounts, Amadeus, and Nexis UK. [37] We compared the boards of the target companies and the boards of their holding companies. The board of the target company may be very small (1 or 2 directors as a symbolic board), while all the important decisions are made by the relevant board in the holding company or the ultimate holding company. Indeed, there is an overlap between these boards. Specially, in some cases all the directors of target companies take seats in the board of the holding company on which PE specialists and other affiliated outside directors (e.g. lawyer and consultant) also sit. If the board of the holding company includes outside directors or directors related to PE sponsors, we identify this board as the relevant board. In other cases, the boards of target companies are larger than boards of holding company and include all the directors of them. For these cases, we identify the board of the target company as the relevant board.

Private companies do not provide full information about their directors' functions. In order to obtain the directors' functions, we use the names of directors' name and companies' name to search for director's information by using deal announcements, Bloomberg business week website http://investing.businessweek.com/, Linkedin, and zoom information http://www.zoominfo.com/.[38] We believe that this is the most comprehensive dataset on SMBO boards used in the literature so far.

We followed the following process to clarify the board's composition. First, we identified the directors whose function in the board is venture capitalists or private equity specialists, or who are also directors or employees of PE firms or directors (function as fund manager, investment banker, or consultant) of companies backed by the same PE firms

[37] Amadeus offers current and previous directors, management, and staff information. Nexis UK provides part biography information of directors and individuals.
[38] Zoom information is a B2B data front-runner that provides detailed profiles of 95 million businesspeople all over the world.

as PE-related directors. Directors nominated by PE firms are also classified as PE-related directors. Second, we classified the directors whose function in the board is non-PE related, i.e. investment banker, chartered accountant, solicitor, lawyers, businessman, university professor, consultant, retired insiders, non-executive director, and non-executive chairman, director of an investing companies, advisor, and directors who are executive directors of other affiliated companies as outside directors. Independent outside directors do not hold ownerships of the target companies and are not employees of affiliated companies. Third, we define inside directors as the CEO, executive chairman, president, vice president, CFO, COO, managing director, finance director, sales director, operating director, manager, marketing director, general managers, company secretary, executive directors of subsidiaries, and other executive directors. We extract data on the independent outside directorship of insiders from Keynotes, https://www.duedil.com/ and http://company-director-check.co.uk/. Independent outside directorship is defined as holding a seat in the board of unaffiliated companies. Unaffiliated companies are classified as companies of which none of block holders is the director of inside director's home board, which are not in the same corporate group as an inside director's home company, and which do not have other observable relationship with the directors or the home company. Finally, we collected information on changes in the top management. In most deal announcements of SMBOs, the demission of top managers, such CEO, CFO, and/or managing directors, will be announced.[39] In cases without a CEO, CFO and managing director, we consider the executive chairman as top management. After combining these different data sources, we obtained a sample of 262 UK SMBOs from 2000 to 2007.

Panel A in Table 3.1 presents the distributions of the sample SMBOs from 2000 to

[39] In cases where we were not able to obtain this information from deal announcements, we turn to board's composition to check the changes in top management.

2010, by entry, exit, and PE backing. This panel demonstrates that although there was a small decrease from 2002 to 2003, the number of entry SMBOs increased from 2000 (except non-PE-backed SMBOs), consistent with other worldwide (e.g. Jenkinson and Sousa, 2014; Bonini, 2013) and UK (Jelic, 2011; Zhou et al., 2013) studies. This panel also demonstrates an increasing trend in the number of exits from SMBOs from 2003 to 2007. During 2007 to 2009, the number of exits from SMBOs decreased sharply but returned to pre-crisis levels more recently. There are 172 PE-backed and 90 non-PE-backed SMBOs.

Insert Table 3.1 about here

The results of our sample industry distribution by PE backing are reported in Panel B of Table 3.1. We classified our sample buyouts into 9 broad industries: Internet and Computers, Communications and Electronics, Business and Industrial, Consumer, Energy, Biotech and Healthcare, Financial Services, Business Services, and all others.[40] Similar to chapter 2, Business Services (38.93%) is the largest industry group in our sample, followed by Consumer (24.05%) and Business and Industrial (22.90%). PE-backed SMBOs tend to be more popular in Consumer sector while less popular in Business and Industrial sector. The result of a Kolmogorov-Smirnov (K-S) test, however, suggest same industry distributions of PE-backed and non-PE-backed SMBOs.

3.3.2 Descriptive statistics [41]

Panel A of Table 3.2 presents descriptive statistics of the total sample and subsamples by PE-backing. Notably, the managerial ownership (*MGTSHARE*) accounts for 61.4% on average (60% in median) in full sample, suggesting high managerial ownership in SMBOs. Moreover, the median value of it in the non-PE-backed subsample is 100%. Second, we observe significant differences between PE-backed and non-PE-backed

[40] For more details, see Zhou et al. (2013).
[41] Definitions of all variables are presented in Appendix 3.1.

subsamples for all variables. PE-backed SMBOs have lower managerial ownership while higher leverage than non-PE-backed SMBOs. Also, PE-backed SMBOs exhibit better previous performance than non-PE-backed SMBOs. PE-backed SMBOs seem to be larger than non-PE-backed SMBOs. But non-PE-backed SMBOs spend longer in the secondary stage, compared to PE-backed SMBOs.

Insert Table 3.2 about here

Panel B presents the Pearson correlation for all variables used in our main regressions. The significant correlation coefficients between *MGTSHARE* and *LNSIZE* and *MGTSHARE* and *PE* are -0.60 and -0.71, respectively, suggesting potential multicollinearity problem in regressions.[42]

3.4 Empirical results

3.4.1 Changes and characteristics of SMBO boards: Post- vs. Pre- SMBOs

Table 3.3 presents our univariate analysis of board changes and characteristics in the sample SMBOs and differences between PE-backed and non-PE-backed SMBOs subsamples**.** The average board size (*BS*) of the full SMBO sample after SMBO transactions is 5.148 (Panel A[43]). As expected, the average board size is lower than in large publicly owned companies in the UK.[44] The average board size of the full sample does not change significantly between the pre- and post- SMBO periods.

We find that the average board size of PE-backed SMBOs is larger than in non-PE-backed SMBOs, regardless of the pre-and post-SMBO phases. Furthermore, PE-backed

[42] To resolve this issue, we replace the managerial ownership with a dummy variable that equals 1 if the management participates in the SMBO transaction and zero otherwise. The regression results (See Appendix3.2) are qualitatively similar as our main results. Hence, we still use the original variable definition for managerial ownership.
[43] We provide evidence by using median values in Appendix 3.4. The results are similar.
[44] Guest (2009) for example reports an average board size of 7.18 of his sample of large UK firms from 1981 to 2002.

SMBOs significantly increase the board size by 0.222, on average, after SMBO transactions. In contrast, in the non-PE-backed subsample the board size decreases significantly by 0.402, on average. We also observed significant changes in the configuration of the boards in sample SMBOs. For example, the fraction of inside directors on the board (*Insiders*) decreases significantly (by 4.219% on average) in PE-backed subsample while increases significantly (by 10.523% on average) in non-PE-backed subsample. There are more directors on average related to (i.e. appointed or employed by) PE firms (*PED*) in the post-SMBO phase (3.381% increase in full sample and 7.944% in PE-backed subsample) compared to the pre-SMBO phase. By contrast, the average fraction of independent outside directors on the boards (*Independent outsiders*) decreases significantly in both the full sample and the non-PE-backed subsample (1.100% and 2.321% on average, respectively). Similarly, we observed a significant decrease in other outsiders (*Others*). Overall, PE-backed SMBOs tend to replace insiders and non-PE-related outsiders with PE-related directors. Taking seats on boards, therefore, is still an important corporate governance mechanism in PE-backed SMBOs. Notably, the demand for hiring non-PE-related outsiders is weakened, because PE-related directors, per se, are experienced and professional experts who can satisfy the monitoring and advising demands. As expected, in non-PE-backed SMBOs more mangers (e.g. insiders) are taking seats on the board. Outsiders are more likely to be fired by non-PE-backed SMBOs, as outsiders are usually the representatives of the outside shareholders who exit through SMBOs.

Insert Table 3.3 about here

Panel B shows the characteristics of skilled insiders (*OD*) and their other engagements (*MOD*). In the five year period after the SMBOs, 17.669% of firm-year observable SMBOs have skilled insiders with independent outside directorships. The

percentage of firm-year observable SMBO boards with skilled insiders in the PE-backed subsample (19.766%) is significantly greater than that of non-PE-backed subsample (13.911%). PE-backed SMBOs are therefore more likely to recruit skilled insiders onto the boards. However, we do not observe statistically significant differences between both subsamples with respect to the busy insiders (*MOD*).

Panel C demonstrates that 47.641% of SMBOs of the full sample SMBOs replace top managers such as CEOs and CFOs (*MGTCHAN*) after transactions. More specifically, 51.416% of SMBOs of the PE-backed subsample change top managers, which is significantly greater than in the non-PE-backed subsample (40.909%). Replacing top managers is therefore an important corporate governance mechanism adopted by PE firms. In addition, our results show that 21.189% of non-PE-backed SMBOs remove PE-related directors from their boards after SMBO transactions, along with the exit of selling PE firms.

3.4.2 Post-SMBO performance

We adopt the same measurements of post-SMBO abnormal performance as Barber and Lyon (1996).[45] Table 3.4 shows the abnormal performance of the sample SMBOs up to five years after SMBO transactions. Panel A presents the results of the sample. The results from the 'level' model demonstrate significant decreases in (unadjusted) performance, except for productivity which increases significantly. However, when we control for industry performance benchmark (i.e. industry adjusted performance), the results show a significant deterioration in performance, except for the sales growth. Underperformance is particularly evident in the forms of profitability (*AROA*), productivity (*ASALEMP*) and employment growth (*AEMPG*). This is the case both in the terms of the statistical significance and the number of companies with negative performance. Panel B presents the

[45] See Chapter 2 for more details.

results stratified by PE backing. The results of the PE-backed subsample are similar to the results in Panel A. Other than the industry adjusted abnormal performance in productivity, the results of the non-PE-backed subsample do not demonstrate strong evidence of underperformance after SMBO transactions. When we use industry adjusted measurements, we do not observe significant and negative results of employment growth and sales growth. Panel C presents the difference values in abnormal performance between PE-backed and non-PE-backed SMBOs. We can see that in general PE-backed SMBOs underperform non-PE-backed SMBOs in terms of profitability and growth ratios. Even though PE-backed SMBOs outperform non-PE-backed SMBOs in productivity, this superiority reverses in year 5.

Insert Table 3.4 about here

3.4.3 Characteristics of SMBO boards and post-SMBO performance-univariate analysis

Table 3.5 presents the univariate analysis of post-SMBO abnormal performance and key corporate governance variables. In Panel A, column (1) presents the differences in the median values of post-SMBO abnormal performance of SMBOs with and without skilled insiders (*OD*). SMBOs with skilled insiders on the boards perform better than their counterparts. For instance, the median values of abnormal performances of SMBOs that have skilled insiders on the boards are significantly greater than those of SMBOs that do not have skilled insiders on the boards in terms of productivity, employment growth, and sales growth (unadjusted difference: 0.020, 0.026, and 0.072, respectively; industry adjusted difference: 0.017, 0.029, and 0.073, respectively).[46]

[46] The difference in median values of industry adjusted *AROS* is 0.010, indicating that SMBOs with skilled insiders only weakly outperform those without skilled insiders in terms of industry adjusted *AROS* measured profitability.

Column (2) shows the difference in post-SMBO abnormal performance of SMBOs with and without replaced top managers (*MGTCHAN*). We do not observe strong evidence that SMBOs which replace top managers have a better post-SMBO abnormal performance than SMBOs not replacing top managers, except with regard to employment growth and unadjusted *AROA*. For example, the industry adjusted employment growth of SMBOs with replacing top managers is significantly smaller compared to their counterparts which did not replace top managers.

Column (3) focuses on the importance of removing PE-related directors from the board (*removed PED*). We tested the difference in abnormal performance between non-PE-backed SMBOs that used to have PE-related directors before transaction and non-PE-backed SMBOs that did not have PE-related directors either before or after SMBOs. We found that the former performs significantly worse than the latter in terms of employment growth (unadjusted difference: -0.063; industry adjusted difference: -0.076) and sales growth (industry adjusted difference: -0.084). These results suggest the importance of PE-related directors in improving the target companies' performance.

Insert Table 3.5 about here

In Panel B, we compare the median values of post-SMBO abnormal performance of SMBOs with and without skilled insiders and changing top managers in terms of PE backing. With respect to the PE-backed subsample, SMBOs with skilled insiders on the boards perform better than their counterparts in employment growth (industry adjusted) and sales growth (both unadjusted and industry adjusted). SMBOs with top managers' replacement outperform their counterparts in industry adjusted productivity while underperforming in industry adjusted employment growth. As to the non-PE-backed

subsample, compared to SMBOs without skilled insiders on the boards, SMBOs with skilled insiders on the boards perform better in *ROS* measured profitability (both unadjusted and industry adjusted), productivity (unadjusted), employment growth (industry adjusted), and sales growth (both unadjusted and industry adjusted). SMBOs which replace top managers perform better than others in unadjusted profitability (measured by both *ROA* and *ROS*). Overall, skilled insiders tend to play a more important role in the non-PE-backed subsample.

3.4.4 Characteristics of SMBO boards and post-SMBO performance-multivariate analysis

To test our hypotheses on the influence of board structure on post-SMBO performance, we use random-effects GLS regression.

$$AP_{it}=\alpha+\beta_1 LNBS_{it}+\beta_2\ PED_{it}+\beta_3 Independent\ outsiders_{it}+\beta_4 MGTCHAN_i+\beta_5 OD_{it}+\beta_6 MOD_{it}+\beta_7 MGTSHAR_{it}$$

$$+\beta_8 GEAR_{it}++\beta_9 LNDURATION_i+\beta_{10} LNSIZE_i+\beta_{11} Crisis_{it}+\beta_{12} ROAt\text{-}1_i+\beta_{13} PE_i+\varepsilon_{it} \qquad \textit{(Equation 1)}$$

Where, dependent variables (*APit*) are abnormal performance ratios of profitability (*AROA*, *AROS*), productivity (*ASALEMP*), employment growth (*AEMPG*), and sales growth (*ASALG*). In addition to the control variables used in previous chapter, we include two important governance mechanisms of buyouts: managerial ownership (*MGTSHARE*) and leverage (*GEAR*). We also control for busy directors (*MOD*), as too many independent outside directorships (more than three) may decrease their attractiveness to their home board (Fich and Shivdasani, 2006). The regression includes entry year dummies and industry dummies to control for time factor and industry factor. In order to correct for the heteroskedasticity of standard errors, z-statistics are based on robust standard errors. We also omit variables that cause multicollinearity problems.

The results of our regression models for the full sample are presented in Table 3.6.

Panel A uses unadjusted abnormal performances while Panel B uses industry adjusted abnormal performance as a robustness test. In Panel A, the R-squared of the models varies from 5.71% (estimates for *ASALEMP*) to 14.10% (estimates for *AROA*). In Panel B, the R-squared of the models varies from 6.37% (estimates for *ASALG*) to 12.25% (estimates for *AROA*). Wald Chi2 is statistically significant in the models of all performance measures in both panels.

Insert Table 3.6 about here

We expected the board size (*LNBS*) to have a positive relationship with post-SMBO performance (H1). In Panel A, the coefficients on board size are not statistically significant, except for the model with the abnormal performance in employment growth (*AEMPG*). In *AEMPG* regression the coefficient on board size is negative and marginally significant (coefficient: -0.100, z-stat: -1.891). When we control for industry benchmark (Panel B), the coefficients for board size remain not statistically significant in all models. These do not lend support to H1. A possible reason could be related to our earlier findings that the average board size of the full sample does not change significantly after SMBO transactions.

We predicted a positive effect of the fraction of PE-related directors on the board (*PED*) on post-SMBO performance (H2). In Panel A, the effect of the fraction of PE-related directors on the board is positive and significant in the model for *AROA* (coefficient: 0.233, z-stat: 2.501), marginally significant in the model for *ASALEMP* (coefficient: 0.103, z-stat: 1.781), marginally significant in the model for *ASALG* (coefficient: 0.396, z-stat: 1.826), and insignificant in the other two models. The variation in the magnitude of the coefficient suggests that the fraction of PE-related directors on the board matters most for profitability (*AROA*) and sales growth (*ASALG*). For example, a one point increase in the fraction of PE-related directors on the board leads to 23.3% and 39.6% increases in *AROA* and *ASALG*,

while only 10.3% increases in *ASALEMP*. These findings are consistent with our prediction. When we use industry adjusted abnormal performance as the dependent variables, we find that the magnitude of the coefficient increases, compared to those from regressions using unadjusted abnormal performance (Panel B). For instance, a one point increase in the fraction of PE-related directors on the board leads to 24.8% (z-stat: 2.492), 11.4% (z-stat: 1.722), and 42.2% (z-stat: 2.009) increases in *AROA*, *ASALEMP*, and *ASALG*, respectively.

The coefficients for independent outsiders (*Independent outsiders*) are not statistically significant (models in both Panel A and Panel B), except in the model for *AEMPG* (Panel A). The positive impact of the fraction of independent outsiders on unadjusted abnormal performance in employment growth is economically and statistically significant (coefficient: 0.493, z-stat: 1.995), suggesting that a one point increase in the fraction of independent outsiders on the board will increase the unadjusted abnormal performance in employment growth by 49.3%. Thus, we find little evidence to support our H3. One interpretation of the above results is that PE-related directors already possess the necessary skills, experience, and knowledge, causing independent outsiders to be less important.

We also predicted that replacing top managers on the boards (*MGTCHAN*), especially CEOs, will improve post-SMBO performance (H4). Nevertheless, we only demonstrate a positive and significant relationship between replacing top managers and post-SMBO performance in both unadjusted (coefficient: 0.124, z-stat: 2.573) and industry adjusted (coefficient: 0.123, z-stat: 2.35) *ASALG*. This result is consistent with those in Cornelli and Karakar's paper (2013) that CEO turnover is not sensitive to previous performance and does not improve post-buyout operating performance.

Finally, we expected that skilled inside directors will enhance post-SMBO

performance (H5). In other words, SMBOs with skilled insiders (*OD*) perform better than others.[47] The coefficients for skilled insiders are not statistically significant in regressions for unadjusted and industry adjusted abnormal performance in profitability (measured by both *AROA* and *AROS*). In Panel A, the coefficients for SMBOs with skilled insiders are positive and marginally significant in the model for *ASALEMP* (coefficient: 0.028, z-stat: 1.651), significant in the model for *AEMPG* (coefficient: 0.080, z-stat: 2.309), marginally significant in the model for *ASALG* (coefficient: 0.085, z-stat: 1.688). The SMBOs with skilled insiders on the boards (*OD*) exhibit higher positive changes in unadjusted productivity, employment growth, and sales growth. When using industry adjusted abnormal performance as the dependent variables in these three models (Panel B), the magnitude of the coefficients increases and the absolute values of t statistics become greater, suggesting even more influence on the post-SMBO performance. These results are consistent with our univariate analysis and our H5. Overall, skilled insiders (*OD*) are an important driver of post-SMBO performance.

Among the control variables, the busy directors dummy (*MOD*) does not impact post-SMBO performance. Higher leverage (*GEAR*) is associated with lower profitability (unadjusted: *AROA* and *AROS*; industry adjusted: *AROS*) in the post-SMBO phase.[48] As expected, the recent financial crisis is negatively associated with profitability (unadjusted *AROS*), productivity (industry adjusted *ASALEMP*), employment growth (unadjusted and industry adjusted *AEMPG*), and sales growth (unadjusted *ASALG*). Previous performance is negatively related to post-SMBO performance in profitability (unadjusted and industry adjusted *AROA* and *AROS*). Notably, PE backing (*PE*) does not seem to be an important

[47] We re-estimate the regressions with an alternative measure for skilled insiders by using the fraction of insiders (those we can identify the functions) with independent outside directorships on the board. The results are qualitatively similar, expect from the *OD* loses its significance in the model of *ASALEMP*.

[48] This result is in line with the evidence that SMBOs are cutting investments in order to meet their debt payments (Jenkinson and Sousa, 2014).

factor of post-SMBOs performance.

3.5 Robustness checks and further analysis

3.5.1 Potential endogeneity

Endogeneity is viewed as an important and pervasive issue in empirical corporate finance research that investigates the causes and effects of financial decisions, due to the difficulty of obtaining suitable exogenous factors that reveal the actual relations of causes and effects (Wintoki et al., 2012). Endogeneity, therefore, can lead to bias and inconsistent estimates that make the results spurious (Roberts and Whited, 2014). For example, we usually cannot detect whether the cause and effect relationship between governance mechanisms and company performance is reversed or whether governance mechanisms and performance are simultaneously caused by other unobservable factors (e.g. Hermalin and Weisbach, 2001; Wintoki et al., 2012).

Roberts and Whited (2012) suggest two main causes of endogeneity: omitted variables and simultaneity. Wintoki et al. (2012) add a further cause, namely dynamic endogeneity, which is caused by the past company's performance determining the current values of board structure variables which in turn affect the current performance. Empirical studies demonstrate that all the three causes affect the relationship between governance structure and company performance (e.g. Hartzell et al., 2006). Corporate governance researchers usually prefer fixed effects panel models (Wintoki et al., 2012). These traditional methods, however, assume the absence of dynamic endogeneity. This assumption is not realistic. Therefore, Wintoki et al. (2012) introduce dynamic generalized method of moments (GMM) panel models. This approach includes a lagged value of

performance in the regression and use system GMM estimation method[49] to solve the edogeineity issues, especially, the dynamic process that exists in the relationship between board structure and performance. Thus, we estimate the following dynamic panel model via GMM by employing an instrumental variables set of the lagged values of our dependent and independent variables, except for *Crisis:*[50]

$$AP_{it}=\alpha+\kappa AP_{it-1}+\gamma_1 LNBS_{it}+\gamma_2\, PED_{it}+\gamma_3 Independent\ outsiders_{it}+\gamma_4 MGTCHAN_i+\gamma_5 OD_{it}+\gamma_6 MOD_{it}$$
$$+\gamma_7 MGTSHAR_{it}+\gamma_8 GEAR_{it}+\gamma_9 LNDURATION_i+\gamma_{10} LNSIZE_i+\gamma_{11} Crisis_{it}+\gamma_{12} ROAt\text{-}1_i+\gamma_{13} PE_i+\mu_i+\varepsilon_{it}$$

(Equation 2)

The results are presented in Table 3.7. The coefficient estimates for board size (*LNBS*) are not statistically significant in all models. Our results show that the Hansen tests yield p-values greater than the 10% significant level, suggesting that our instrumental variables are valid. Similarly, the p-values from the Arellano-Bond test of second order serial correlation AR (2) test are greater than 0.1 and as such, we cannot reject the null hypothesis of no second order serial correlation. Therefore, our main finding on the relationship between board size and post-SMBO performance is not driven by omitted variables, simultaneity, and dynamic endogeneity. However, the F-test for model goodness of fit are very small and insignificant for all models, except the model with *AROS*, indicating that dynamic GMM is not suitable to our dataset or that our model is mis-specified.

Insert Table 3.7 about here

One interpretation is that in (primary) buyouts in general, and in SMBOs in

[49] System GMM estimation procedure firstly takes the first difference of equation 2 to eliminate the potential bias from time-invariant unobservable heterogeneity. Then it estimates the system which consists of both first difference model and original model (equation 2 here) via GMM using lagged values of endogenous variables (all independent variables except *Crisis* here) as instruments for the current changes in these endogenous variables. One important assumption for this estimation procedure is that these lagged values are exogenous and determinants of the changes in these endogenous variables. This assumption is motivated by the theory of corporate governance.

[50] *xtabond2* command in Stata (See Appendix 3.3).

particular, the above sources of endogeneity may be of less importance. The arrival of PE investors and the subsequent changes they make are less likely to be a consequence of a negotiation process between the CEO and board members as is normally the case in large publicly owned companies. Instead, they are rather abrupt changes imposed by the PE firms.[51] The abrupt changes are part of the PE's tool kit for performance improvement. PE firms tend to have (almost) all the power to make changes irrespective of the previous performance. In non-PE-backed (primary and even more secondary) buyouts ownership is concentrated in hands of manager-owners so the bargaining position of the boards is again very limited.

3.5.2 Potential selection biases

3.5.2.1 PE investment

In the SMBO context, we conjecture that PE firms execute due diligence to invest in companies with certain characteristics that lead to the success in the SMBO phase. This may lead to sample selection bias. The conjecture is in line with our sample descriptive statistics (Table 3.2) which suggests significant differences of size and pre-SMBO performance between PE-backed SMBOs and non-PE-backed SMBOs.

To address issues related to the potential selection bias, we employed a Heckman (1979) two-step model similar as Chapter 2 as a robustness test. The two step regressions are as follows:

$$PE_i=\alpha+\beta_1 BSERVICES_i+\beta_2 LNSIZE_i+\beta_3 ROAt\text{-}1_i+\varepsilon_i \qquad \textit{(Equation 3)}$$

$$AP_{it}=\alpha+\beta_1 LNBS_{it}+\beta_2\ PED_{it}+\beta_3 Independent\ outsiders_{it}+\beta_4 MGTCHAN_i+\beta_5 OD_{it}+\beta_6 MOD_{it}+\beta_7 MGTSHAR_{it}$$
$$+\beta_8 GEAR_{it}++\beta_9 LNDURATION_i+\beta_{10} LNSIZE_i+\beta_{11} Crisis_{it}+\beta_{12} ROAt\text{-}1_i+\beta_{13} PE_i+\beta_{14} Lambda1_i+\varepsilon_{it}$$

(Equation 4)

[51] Using the terminology of Wintoki et al., (2012), they tend to be much closer to a 'natural experiment'.

In the first step, we estimated a Probit regression with a robust variance estimate for the probability of a new PE firm's involvement in a sample SMBO. The dependent variable (*PE*) is a categorical variable equal to 1 if the SMBO is PE-backed and 0 otherwise (equation 3).[52] We hypothesize that the choice of a PE firm to invest in an SMBO is associated with size of the SMBO (*LNSIZE*), pre-SMBO performance (*ROAt-1*), and the target company's industry (*BSERVICES*).[53] *Lambda1* is the estimated probability of a PE firm's investment in an SMBO. In the second step, we include *Lambda1* as an additional explanatory variable.

The results of the Probit model and new panel regressions are presented in Table 3.8. Notably, the coefficient on the previous profitability in the Probit model is not statistically significant. Larger companies are more likely to become targets for SMBOs than smaller ones. The panel regression results are economically and statistically consistent with those reported in Table 3.6, except from the model for *AEMPG*. In the model for *AEMPG*, the fraction of PE-related directors on the boards (*PED*) is significantly and positively related to the changes in employment growth (coefficient: 0.371, z-stat: 1.718). Furthermore, *Lambda1* is significant, indicating the existence of a sample selection bias in the *AEMPG* model. Other main results are qualitatively similar to those in Table 3.6. Our main results in Table 3.6 are, therefore, qualitatively robust to the potential sample selection bias.

Insert Table 3.8 about here

3.5.2.2 PE-related directors

Another potential selection bias could be caused by the decision of PE firms to appoint PE-related directors onto the board. This decision may be driven by the target

[52] The Hosmer-Lemeshow suggests that the Probit model fits our data while the Logit model does not.
[53] The selected variables were identified as important variables for PE's investments in the existing literature. See Brau et al., (2003) and Strömberg, (2008) for size; Bienz, (2004) for pre-event performance; and Berger et al., (1999) and Bayar and Chemmanur, (2006) for industry.

companies' quality and PE firms' ability to identify good deals (Chahine and Georgen, 2011). For instance, syndicated PE firms are more likely to take more seats on the board than others. Highly reputed PE firms are also more likely to identify good deals, hence, less likely to take seats on the boards than others. Similarly, high leverage could cause target companies under banks' close scrutiny, so PE firms may be less likely to take seats than deals with low leverage. Changing the top managers also reduces the probability of appointing PE-related directors. To address this issue, we employed a Heckman (1979) two-step model again with the PE-backed SMBO subsample. The two step regressions are as follows:

$$PED\ dummy_{it}=\alpha+\beta_1 Club\ deals_i+\beta_2 Top10_i+\beta_3 LNSIZE_i+\beta_4 PE_i+\beta_5 GEAR_{it}+\beta_6 MGTCHAN_i+\beta_7 Crisis_{it}+\beta_8 ROAt\text{-}1_i+\varepsilon_{it} \quad \textit{(Equation 5)}$$

$$AP_{it}=\alpha+\beta_1 LNBS_{it}+\beta_2\ PED_{it}+\beta_3 Independent\ outsiders_{it}+\beta_4 MGTCHAN_i+\beta_5 OD_{it}+\beta_6 MOD_{it}+\beta_7 MGTSHAR_{it}+\beta_8 GEAR_{it}++\beta_9 LNDURATION_i+\beta_{10} LNSIZE_i+\beta_{11} Crisis_{it}+\beta_{12} ROAt\text{-}1_i+\beta_{13} PE_i+\beta_{14} Lambda2_i+\varepsilon_{it} \quad \textit{(Equation 6)}$$

In the first step, we estimated a Logit regression with a robust variance estimate for the probability of PE firms holding seats on the board of the sample SMBO. The dependent variable (*PED dummy*) is a categorical variable that equals 1 if the SMBO board has PE-related directors and 0 otherwise (equation 5).[54] We hypothesized that the decision of a PE firm to appoint its own people onto the board is associated with the following: whether the deal is syndicated or not (*Club deals*); the high reputation of the leading PE firms (*Top10*); the size of the SMBO (*LNSIZE*); whether the SMBO is PE backed (*PE*); leverage (*GEAR*); whether the board replaces top managers (*MGTCHAN*); financial crisis (*Crisis*); and pre-SMBO performance (*ROAt-1*).[55] *Lambda2* is the estimated probability of PE-related

[54] The Hosmer-Lemeshow suggests that Logit model fits to our data while Probit model does not.
[55] The selected variables were identified as important variables for PE-related directors in previous literature

directors on the boards. In the second step, we include *Lambda2* as an additional explanatory variable. All results are presented in Table 3.9. The results are consistent with our main results presented in Table 3.6 and *Lambda2* is insignificant in all models. The self-selection bias related to PE-related directors is, therefore, not important in our dataset.

Insert Table 3.9 about here

3.5.3 Replacement of top managers and previous performance

Companies with poor performance tend to replace CEOs (Hermalin and Weisback, 2003). Thus, the impact of replacing top managers will depend on companies' previous performance. And companies that perform poorly would be more likely replace top managers (e.g. Christian and Marc, 2011). We, therefore, include an interactive variable (*ROAt-1* MGTCHAN*) between the dummy variable for the replacement of top managers (*MGTCHAN*) and the (continuous) variable for previous performance (*ROAt-1*). If the decision to replace top managers depends on previous performance, the coefficient on this interactive variable should be significant.

The coefficients for the interactive variable represented in Table 3.10 are not statistically significant. The relationship between the decision to replace top managers and post-SMBO performance is not statistically affected by the previous performance.

Insert Table 3.10 about here

3.5.4 PE-related directors and PE firm's reputation

Highly-reputed PE firms often hire better PE specialists and invest in more companies.[56] Given that the number of PE specialists is limited, holding multiple board seats will increase the number of portfolio companies per PE specialist. As a consequence,

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(see Chahine and Georgen, 2011; Cornelli and Karakas, 2013).

[56] Here we only discuss the leading PE firms.

PE specialists will not be able to spend enough time and energy on a single company and probably fail to add value. Alternatively, PE firms could hire more PE specialists to meet the demand for their expertise. We expect that highly-reputed PE firms can attract better specialists and achieve more efficient allocation of PE specialists across portfolio companies. Thus, the reputation of PE firms may affect the relationship between the fraction of PE-related directors and post-SMBO abnormal performance.

We therefore introduce the interaction term (*PED*Top10*) of highly-reputed PE firms (*Top10*) and the fraction of PE-related (*PED*). [57] Hence, we repeated the regressions for the PE-backed subsample. The results are reported in Table 3.11. The interaction term is negative and statistically significant in the model for *AROS* (coefficient: -0.381, z-stat: -2.691); significant in the model for *AEMPG* (coefficient: -0.860, z-stat: -2.630); marginally significant in the model for *ASALG* (coefficient: -0.723, z-stat: -1.740); and not significant in the other two models. When SMBOs are backed by highly-reputed PE firms, the fraction of PE-related directors has a weaker relationship with post-SMBO performance. Interestingly, the negative effect of the interaction term is greater than the main effect of the fraction of PE-related directors. As a consequence, the total effect of the fraction of PE-related directors will be negative in SMBOs backed by highly reputable PE firms.

Insert Table 3.11 about here

3.5.5 Removal of PE-related directors

In the univariate analysis we find that non-PE-backed SMBOs that remove PE-related directors from the board tend to underperform their counterparts. The boards undergoing transition towards operating without having PE-related directors may be badly affected and thus perform worse than those whose boards not undergoing such a transition.

[57] We create a dummy variable (*Top10*) for top 10 PE firms.

Hence, we included a dummy variable for the removal of PE-related directors from the respective board (*Remove PED*) and repeated the regressions for the non-PE-backed subsample.

The results are presented in Table 3.12. Surprisingly, the coefficients on the dummy variable of removing PE-related directors are not statistically significant in all models. Moreover, our results show the coefficients for our main explanatory variables (*LNBS, Independent outsiders*, *MGTCHAN*, and *OD*) are not statistically significant. The coefficient for replacing top managers (*MGTCHAN*) in model for *AROS* measured profitability (coefficient:-0.115; z-stat: -1.959) is statistically significant at the 10% level. One possible explanation for the insignificant coefficient for having skilled insiders on boards (*OD*) could be that the investors in non-PE-backed SMBOs tend to be senior managers. If they held seats on the boards in the pre-SMBO phase, they would not be able to bring a new expertise to the boards in the post-SMBOs phase. Furthermore, manager-shareholders might not be as good at choosing skilled executives as PE firms.

Insert Table 3.12 about here

3.5.6 Early vs. late exits

Primary PE firms may exit early due to the limited life of PE fund or may try to enhance their reputation by creating a track record of exits. When PE firms exit early, especially in the first 2-3 years, the value creation potential may not be exhausted, thus leaving performance improvement potential for the secondary round. Both Arcot et al. (2014) and Degeorge et al. (2013) find that SMBO exits are more likely when sellers are under exiting pressure to exit than those not encountering such pressure. Under this scenario, corporate governance mechanisms (e.g. changing top managers, employing independent outsiders) should improve the operating performance as a result. In SMBOs

with long holding periods in the pre-SMBO phase, the relationships between the measures of the mechanisms adopted to improve the monitoring and advisory functions of boards and the post-SMBO performance are therefore expected to be weaker.

Insert Table 3.13 about here

We stratified the SMBO sample by duration of time spent in the primary stage. We classified SMBOs with a primary holding period of less than 3 years and of equal to or longer than 3 years into the 'early' subsample and the 'late' subsample, respectively.[5859] The results are presented in Table 3.13. Our results of 'early' subsample (Panel A) show that the coefficient for the fraction of PE-related directors (*PED*) is positive and marginally statistically significant in the model for *AEMPG* (coefficient: 0.732, z-stat: 1.798). The fraction of independent outsiders is positively and significantly associated with post-SMBO performance in *AEMPG* (coefficient: 2.144, z-stat: 2.309) and *ASALG* (coefficient: 1.898, z-stat: 1.840). It should be noticed that the magnitudes of the coefficients are very high. Independent outsiders tend to play a crucial role in improving post-SMBO growth performance. Moreover, the effect of replacing top managers (*MGTCHAN*) is stronger than the results for the full sample. For instance, the coefficient on replacing top managers is 0.098 (z-stat: 2.105) in the model for *AROA* measured profitability and 0.366 (z-stat: 2.150) in *ASALG*. In addition, we find that having skilled insiders (*OD*) is positively and significantly related to the post-SMBO performance in *AROA* measured profitability (coefficient: 0.093, z-stat: 2.621) and *AEMPG* (coefficient: 0.261, z-stat: 2.319).

In the case of the 'late' subsample (Panel B), we found a stronger impact of the

[58] We also considered analyzing cases where the holding period was shorter than 2 years. However, there are only 19 SMBOs that meet this criterion, causing the regression to be invalid.

[59] According to Appendix 3.5, we found that the median values of dependent variables (AROA, AROS, AEMPG, and ASALG) of these two subsamples are statistically similar, except from ASALEMP. Nevertheless, the median values (or the proportions of dummy variables) of the two subsamples are significantly different for most explanatory variables, especially, the tested BS, PED, Independent outsiders, and OD.

fraction of PE-related directors (*PED*) on the post-SMBO performance compared to the results in 'early' subsample. For instance, the coefficient for the fraction of PE-related directors is positive and marginally significant in the model for *AROA* (coefficient: 0.179, z-stat: 1.778), significant in the model for AEMPG (coefficient: 0.219, z-stat: 2.730), and significant in the model for *ASALG* (coefficient: 0.137, z-stat: 2.161). We also find a significantly positive relationship between skilled insiders (*OD*) and *ASALEMP*, lending some support to the argument that SMBOs exited late in the primary stage are difficult and could have no value creation room left.

The above results demonstrate that the characteristics of the board of directors play an important role in the performance improvement in the 'early' subsample. Furthermore, for more difficult SMBOs (i.e. the 'late' subsample) with a little performance improvement potential left, the special skills of PE-related directors tend to be of crucial importance.

3.5.7 Tested-down regression model[60]

First, we conducted the regressions with all parameters (as in Panel A of Table 3.6). Second, we excluded the variables with the most insignificant coefficients (those have the smallest z-stat) and re-ran the regressions. This procedure was repeated until all remaining variables have statistically significant coefficients. The final results are presented in Table 3.14.

The results highlight the importance of boards in enhancing SMBOs' performance. For instance, the significant and positive impact of PE-related directors (*PED*) on the post-SMBO performance is observed in all models, except in the model for *AROS*. Having

[60] We employed Theil's R^2 criterion to compare equation (1) with these tested-down regression models. The results prefer equation (1). Furthermore, the motivation to process the tested-down regression models was to examine whether the significances of our focus variables will be affected by excluding insignificant variables (multicollinearity issue). Our interest of this chapter is to investigate the impact of all the hypothesized independent variables on the dependent variables based on the theories, no matter the results are significant or insignificant. Thus, the model selection strategies should not be a critical issue in our case.

skilled inside directors (*OD*) significantly improves post-SMBO performance in terms of employment growth (*AEMPG*) and sales growth (*ASALG*). The coefficients for board size, independent outsiders, and replacing top managers are qualitatively similar to our main results reported in Table 3.6. Overall, the boards mainly affect growth performance (*AEMPG* and *ASALG*) of SMBOs.

Insert Table 3.14 about here

3.6 Conclusion

Using a unique, hand-collected dataset of 262 UK SMBO deals, we analyzed important changes in the board of directors in SMBOs and their effect on post-SMBO performance. We argue that the new board structures could improve SMBOs' performance. Our univariate results document significant changes in the board of directors in SMBOs. There are also significant differences between our PE-backed and non-PE-backed subsamples. For example, the board size decreases significantly in the non-PE-backed subsample while PE-backed SMBOs tend to increase the size of their boards after SMBO transactions. Non-PE-backed SMBOs are more likely to increase the fraction of insiders. Boards in the non-PE-backed subsample exhibit a significant decrease in the fraction of independent outsiders. In contrast, PE-backed SMBOs appoint more PE-related directors in the post-SMBO transaction phase than in the pre-SMBO transaction phase. PE-backed SMBOs are also more likely to replace top managers (e.g. CEO/CFOs), and appoint skilled insiders as directors.

The results from the univairate analysis show statistically significant underperformance after SMBOs. Furthermore, SMBOs with skilled insiders outperform SMBOs without skilled insiders especially in terms of productivity and growth. The results are robust to alternative performance measures. We also find that removing PE-related

directors leads to worse post-SMBO performance in employment growth and sales growth. However, we find little evidence that SMBOs that replace the top managers perform better than others.

As to the multivariate results, we have documented the lack of a statistically significant influence of board size on performance (i.e. profitability, productivity, sales growth). The results contradict the evidence for samples of larger publicly owned (Yermack, 1996) and smaller closely held (non-buyout) companies (Eisenberg et al., 1998) and are more in line with Wintoki et al. (2012). Furthermore, our results show that the fraction of PE-related directors on the board has a positive and significant impact on post-SMBO performance in profitability (*AROA*), productivity, and sales growth. In addition, appointing skilled insiders onto the board leads to better post-SMBO performance in productivity, employment growth, and sales growth. This is consistent with the results of our univariate analysis. Finally, we find little evidence that the fraction of independent outsiders and replacing top managers improves post-SMBO performance. The fraction of independent outsiders has a positive and significant relationship only with post-SMBO employment growth. Replacing top managers only enhances post-SMBO performance in sales growth. These results are robust to alternative abnormal performance benchmarks and potential selection biases. The tested-down model method also supports our main results.

We perform dynamic panel GMM estimation to address the potential endogeneity issue suggested by the corporate governance literature. However, all models, expect from the model for *AROS*, and exhibit no evidence of a significant endogeneity problem.

Our robustness checks show that previous performance does not significantly affect the relationship between replacing top managers and post-SMBO performance. Secondly, the impact of PE-related directors on improving post-SMBO performance tends to be

alleviated by PE reputation. This result suggests the importance of PE firms' experience, knowledge, and /or network on enhancing target company performance. Thirdly, we examined the influence of the removal of PE-related directors on post-SMBO performance in non-PE-backed subsample. However, we did not obtain any evidence to support the importance of removal of PE-related directors for the performance. Finally, we compared the early and late exits. In the subsample of "difficult" SMBOs ('late' exit), appointing more PE-related directors tends to be the most important driver for the performance improvement. In the 'early' subsample, including independent outsiders, replacing top managers, and having skilled insiders play a more important role in performance improvement.

This chapter has highlighted the importance of the board of directors for post-SMBO performance. Although SMBOs tend to underperform, there are still ways to improve performance via the impact of the board of directors. This is especially the case for employment and sales growth. This is consistent with the fact that the majority of SMBOs tend to be in an expansion phase which requires idiosyncratic, skills, and capabilities to exploit growth opportunities. In another words, the boards tend to enhance the boards' advisory function of SMBOs.

There are several limitations to our research. First, we were not always able to obtain full information on board composition for our sample, especially concerning the classification of executive and non-executive directors. Second, the reasons for changes in top management were not always clearly disclosed. This issue prevents us from further investigating the reasons for the negative relationship between top management change and post-SMBO performance in employment growth.

Table 3.1: Sample distribution across years and industries

This table shows SMBOs distribution across years and industries by full sample and PE backing. Panel A shows the number of entry and exited SMBOs across the years. Exit is defined as the SMBO which was exited by 31st, December, 2010. Panel B shows industry distribution of SMBOs. Reported figures are the proportion of SMBOs in industry groups. Reported P-value is two samples Kolmogorov Smirnov (K-S) test for the difference in industry distributions across PE backing. Details of industry grouping are discussed in section 3.3.1.

Panel A: Sample distribution across years

	Full sample		PE backing			
			PE		Non PE	
Year	Entry	Exit	Entry	Exit	Entry	Exit
2000	6		4		2	
2001	18		12		6	
2002	26		13		13	
2003	16	2	7	2	9	
2004	44	5	28	4	16	1
2005	49	10	28	5	21	5
2006	48	13	37	12	11	1
2007	55	23	43	17	12	6
2008		16		8		8
2009		12		8		4
2010		17		12		5
Total	262	98	172	68	90	30

Panel B: Sample distribution across industries

	Full sample	PE backing	
Industry (%):		PE	Non PE
1. Internet &Computers	2.67	2.91	2.22
2. Communications & Electronics	3.82	3.49	4.44
3. Business & Industrial	22.9	18.02	32.22
4. Consumer	24.05	26.74	18.89
5. Energy	1.15	1.16	1.11
6. Biotech and Healthcare	3.82	5.81	0
7. Business Services	38.93	38.95	38.89
8. All other	2.67	2.91	2.22
Total sample	100	65.65	34.35
P-value of PE vs. Non-PE:			0.133

Table 3.2: Sample descriptive statistics and Pearson correlation

This table shows sample descriptive statistics and Pearson correlations. Panel A presents descriptive statistics of the full sample (mean, median and standard deviation) and across PE backing (median) for control variables: management share (*MGTSHARE*), leverage (*GEAR*), return on assets in year prior to SMBO(*ROAt-1*), the logarithm of the holding period (*LNDURATION*), the logarithm of the size of SMBOs (*LNSIZE*), financial crisis (*Crisis*), and PE backing (*PE*). N is the number of SMBOs for *ROAt-1*, *LNDURATION, LNSIZE*, and *PE* and is the number of firm-year observations for *MGTSHARE*, *GEAR*, and *Crisis*, up to five year after SMBO transactions. Differences are the differences of median values between PE-backed and non-PE-backed SMBOs. The Mann Whitney test is used to test the differences. Panel B presents the Pearson correlations for all variables. ***, **, *, indicate the significance of the test at the 1, 5, and 10 % levels respectively. The variables are defined in Appendix 3.1.

Panel A: Descriptive statistics

	Full sample				PE backing (median)		
	N	mean	S.D.	median	PE	Non PE	Differences
MGTSHARE	853	0.614	0.341	0.600	0.406	1.000	-0.594***
GEAR	727	1.421	1.850	0.730	0.770	0.640	0.129**
ROAt-1	255	0.115	0.131	0.100	0.115	0.085	0.030***
LNDURATION	262	1.721	0.192	1.732	1.708	1.820	-0.112***
LNSIZE	261	2.735	1.650	2.862	3.588	1.030	2.558***
Crisis	1285	0.596	0.491	1	1	1	0.000***
PE	262	0.653	0.476	1	N/A	N/A	N/A

Panel B: Pearson correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
ARROA(1)	1																
ARROS(2)	0.48***	1															
ARSALEMP(3)	0.16***	0.08*	1														
AREMPG(4)	0.12***	0.13***	0.04	1													
ARSALG(5)	0.20***	0.07	0.38***	0.62***	1												
LNBS(6)	0.05	0.06	-0.05	-0.07*	0.00	1											
PED(7)	-0.02	-0.01	-0.06	0.01	0.03	0.34***	1										
Independent outsiders (8)	-0.05	-0.02	-0.03	0.09**	0.12***	0.08***	-0.05*	1									
MGTCHAN (9)	0.03	0.02	0.02	-0.01	0.10**	-0.05**	0.06**	0	1								
OD (10)	0.02	0.03	0.04	0.09**	0.13***	0.20***	0.01	-0.02	-0.02	1							
MOD(11)	-0.02	0.02	-0.01	0.02	0.07*	0.07**	0.01	-0.02	0	0.48***	1						
MGTSHARE(12)	0.14***	0.02	-0.04	-0.02	-0.05	-0.34***	-0.54***	-0.14***	-0.08**	-0.11***	-0.04	1					
GEAR(13)	-0.03	-0.04	0	-0.06	-0.04	0.09**	0.04	-0.03	-0.05	0.08**	0.03	-0.15***	1				
LNDURATION (14)	-0.09**	0.04	0.15***	0.05	-0.04	-0.25***	-0.25***	0.07**	0.02	-0.07**	-0.02	0.22***	-0.10***	1			
LNSIZE (15)	-0.07**	0.04	-0.04	-0.02	0.01	0.39***	0.48***	0.03	-0.01	0.07	0	-0.60***	0.09**	-0.19***	1		
Crisis(16)	0.01	0.01	-0.10**	-0.02	0.06	0.02	0.14***	-0.07**	-0.03	-0.09	-0.05	-0.07*	-0.06*	-0.23***	0.12***	1	
ROAt-1(17)	-0.22***	-0.17***	-0.01	-0.13***	-0.10**	0.08**	0.05*	0.02	-0.03	-0.01	0.02	-0.04	-0.08**	0.17***	0.12***	0.02	1
PE (18)	-0.09***	-0.01	-0.06	-0.01	-0.02	0.26***	0.57***	0.05**	0.10***	0.14***	0.04**	-0.71***	0.10***	-0.19***	0.55***	0.11***	0.11***

Table 3.3: Changes and characteristics of SMBO boards- univariate analysis

This table presents changes and characteristics of SMBO boards, up to five years after SMBO transactions. Panel A shows changes in board size and board composition. Presented values are mean values of each variable three years pre- and five years post- SMBO transactions. Difference values are calculated as post-SMBO mean value of each variable minus its pre-SMBO mean value. Panel B reports the percentage of firm-year observations of SMBOs with skilled inside directors (*OD*) and the percentage of firm-year observations of SMBOs with busy inside directors (*MOD*) during SMBO phases, for the full sample and by PE-backing. The difference value is the difference of these values between PE-backed and non-PE-backed subsamples. Panel C presents the percentages of SMBOs that changed the top management in transaction year (*MGTCHAN*), and the percentage of non-PE-backed SMBOs that removed PE directors from the boards in the transaction year (*Remove PED*). We used a two-tailed t-test and two-sample proportion test of the differences in means and proportions, respectively. All variables are defined in Appendix 3.1. *, **, ***, are significant at the 10%, 5%, and 1% levels respectively.

Panel A:	No. of observations	Full sample			PE backing (mean)					
		Mean			PE			Non- PE		
		Post	Pre	Difference	Post	Pre	Difference	Post	Pre	Difference
BS (N)	1832	5.148	5.154	-0.006	5.509	5.287	0.222**	4.509	4.911	-0.402***
Insiders (%)	1832	78.038	76.871	1.167	69.458	73.677	-4.219***	93.224	82.701	10.523***
PED (%)	1832	12.163	8.782	3.381***	18.828	10.884	7.944***	0.368[61]	4.945	-4.578***
Independent outsiders (%)	1832	3.320	4.420	-1.100***	3.756	4.356	-0.600	2.216	4.537	-2.321***
Others (%)	1832	6.599	9.927	-3.328***	7.958	11.083	-3.125***	4.192	7.817	-3.625***

Panel B:	No. of observations	Full sample	PE backing		
			PE	Non-PE	Difference
OD (%)	1064	17.669	19.766	13.911	5.855**
MOD (%)	1064	5.155	4.978	5.469	-0.491

Panel C:	No. of SMBOs	Full sample	PE backing		
			PE	Non-PE	Difference
MGTCHAN (%)	262	47.641	51.416	40.909	10.507**
Remove PED (%)	91	-	-	21.189	-

[61]Two cases of non-PE-backed SMBOs have PE specialists on the boards.

Table 3.4: Post-SMBO performance

This table presents the median values of abnormal performance measures for the full sample, up to five post-SMBO years (Y 1-5). Abnormal performance (AP_{it}) is calculated as:$AP_{it} = P_{it} - E(P_{it})$. where, P_{it} is the actual performance in year t after SMBO transactions while $E(P_{it})$ is the expected performance of the target company in year t after SMBO transactions. It is estimated by two models: $E(P_{it}) = P_{i,t-k}$, and $E(P_{it}) = P_{i,t-k} + \Delta PI_{it}$; where, the former is 'level' model using unadjusted benchmark and the latter is 'change' model using industry adjusted benchmark. Panel A presents results for the full sample. Panel B presents results by PE backing. Panel C reports the values of differences in abnormal performance between PE-backed and Non-PE-backed SMBOs. The values are calculated as the median value of PE-backed SMBOs minus that of Non-PE-backed SMBOs. All results used 99% winsorized data. Wilcoxon signed rank test (median=0, vs. median≠0) is adopted to test the significance of abnormal performance. We used Wilcoxon rank-sum (Mann Whitney) test for differences in median abnormal performance measures. ***, **, *, indicate significance at the 1%, 5%, and 10 % level respectively. All variables are defined in Appendix 3.1.

Panel A: Full sample

		Y1	Y2	Y3	Y4	Y5
Profitability	Benchmarks					
AROA	$E(P_{it}) = P_{it-k}$	-0.009**	-0.015***	-0.025***	-0.033***	-0.046***
		(248:115)	(215:85)	(164:60)	(128:46)	(85:31)
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	-0.007**	-0.031***	-0.038***	-0.057***	-0.009
		(244:115)	(212:77)	(160:55)	(102:32)	(62:30)
AROS	$E(P_{it}) = P_{it-k}$	0.011**	0.002	-0.003	-0.014**	-0.016**
		(195:109)	(169:85)	(131:61)	(103:43)	(74:26)
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.009	-0.003	-0.006*	-0.007	-0.007
		(191:106)	(164:78)	(127:54)	(78:35)	(51:23)
Productivity						
ASALEMP	$E(P_{it}) = P_{it-k}$	0.032***	0.028***	0.017*	0.029	-0.008
		(180:120)	(157:100)	(116:66)	(91:56)	(52:24)
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	-0.024***	-0.042***	-0.068***	-0.071***	-0.086***
		(166:62)	(140:45)	(106:29)	(63:20)	(29:8)
Growth ratios						
AEMPG	$E(P_{it}) = P_{it-k}$	-0.011	-0.037***	-0.051***	-0.061***	-0.056**
		(187:110)	(158:77)	(121:45)	(71:23)	(39:11)
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	-0.021	-0.032*	-0.050**	-0.056*	-0.036
		(160:71)	(133:56)	(99:32)	(55:24)	(27:11)
ASALG	$E(P_{it}) = P_{it-k}$	-0.027**	-0.049***	-0.051***	-0.098***	-0.141***
		(173:78)	(151:58)	(115:41)	(63:20)	(39:9)
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	-0.003	-0.022	-0.04	0.019	-0.031
		(169:84)	(147:70)	(112:50)	(62:36)	(39:16)

Panel B: PE vs. Non-PE-backed

		PE-backed					Non PE-backed				
		Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5
Profitability	Benchmarks										
AROA	$E(P_{it}) = P_{it-k}$	-0.012**	-0.026***	-0.037***	-0.048***	-0.074***	-0.005	-0.007	-0.009	-0.016*	-0.001
		(161:75)	(144:54)	(106:34)	(76:26)	(45:11)	(87:40)	(71:31)	(58:26)	(52:20)	(40:20)
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	-0.010*	-0.032***	-0.047***	-0.067***	-0.100**	-0.001	-0.031***	-0.021	-0.044**	0.019
		(158:72)	(142:53)	(103:31)	(58:15)	(26:9)	(86:43)	(70:24)	(57:24)	(44:17)	(36:21)
AROS	$E(P_{it}) = P_{it-k}$	0.018**	0.003	-0.002	-0.010	-0.032***	0.004	-0.004	-0.004	-0.016***	-0.004
		(123:71)	(114:59)	(85:41)	(58:27)	(40:12)	(72:38)	(55:26)	(46:20)	(45:16)	(34:14)
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.014	0.004	-0.008	0.002	-0.001	0.004	-0.013	-0.006	-0.015*	-0.014
		(120:68)	(110:57)	(82:35)	(40:21)	(20:10)	(71:38)	(54:21)	(45:19)	(38:14)	(31:13)
Productivity											
ASALEMP	$E(P_{it}) = P_{it-k}$	0.043***	0.034***	0.025**	0.011	-0.133***	0.021**	0.024*	0.005	0.041	0.030
		(115:80)	(104:68)	(74:43)	(52:29)	(27:8)	(65:40)	(53:32)	(42:23)	(39:27)	(25:16)
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	-0.018	-0.035**	-0.057**	-0.024	-0.142*	-0.036***	-0.053***	-0.110***	-0.071***	-0.065*
		(107:48)	(95:34)	(69:21)	(35:15)	(10:8)	(59:14)	(45:11)	(37:8)	(31:5)	(19:6)
Growth ratios											
AEMPG	$E(P_{it}) = P_{it-k}$	-0.001	-0.037*	-0.076***	-0.061**	-0.056	-0.033**	-0.036**	0.004	-0.059	-0.058*
		(120:60)	(107:44)	(84:26)	(41:13)	(17:2)	(67:26)	(51:17)	(37:19)	(30:10)	(22:6)
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	-0.015	-0.033	-0.094***	-0.089*	-0.006	-0.031	-0.029	-0.010	0.015	-0.066
		(103:49)	(90:37)	(69:18)	(31:11)	(10:4)	(57:22)	(43:19)	(30:14)	(24:13)	(17:7)
ASALG	$E(P_{it}) = P_{it-k}$	0.001	-0.07***	-0.067***	-0.138**	-0.201***	-0.042**	-0.028	-0.042	-0.032	-0.091**
		(113:57)	(102:35)	(78:26)	(33:8)	(14:1)	(60:21)	(49:23)	(37:15)	(30:12)	(25:8)
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.011	-0.013	-0.045*	-0.061	-0.051	-0.021	-0.044	0.012	0.067*	-0.031
		(111:58)	(100:48)	(77:32)	(33:15)	(14:6)	(58:26)	(47:22)	(35:18)	(29:21)	(25:10)

Panel C: Difference between PE and Non-PE-backed

		Y1	Y2	Y3	Y4	Y5
Profitability						
AROA	$E(P_{it}) = P_{it-k}$	-0.007	-0.019	-0.028**	-0.032	-0.073***
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	-0.009	-0.001	-0.026*	-0.023	-0.119**
AROS	$E(P_{it}) = P_{it-k}$	0.014	0.007	0.002	0.006	-0.028**
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.01	0.017	-0.002	0.017	0.013
Productivity						
ASALEMP	$E(P_{it}) = P_{it-k}$	0.022**	0.01	0.02	-0.03	-0.163***
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.018*	0.018	0.053**	0.047	-0.077
Growth ratios						
AEMPG	$E(P_{it}) = P_{it-k}$	0.032	-0.001	-0.08	-0.002	0.002
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.016	-0.004	-0.084	-0.104	0.06
ASALG	$E(P_{it}) = P_{it-k}$	0.043	-0.042	-0.025	-0.106	-0.11
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.032	0.031	-0.057	-0.128*	-0.02

Table 3.5: Changes and characteristics of SMBO boards and post-SMBO performance-univariate results

This table presents the difference of post-SMBO abnormal performance by having skilled insiders (*OD*), changing top management (*MGTCHAN*), and removing PE directors out from the board (*Remove PED*).[62] The difference is calculated as the median value of post-SMBO abnormal performance of SMBOs that have skilled insiders (or, changing the top management, removing PE-related directors) minus the median value of post-SMBO abnormal performance of SMBOs that do not have skilled insiders (or, do not change the top management, do not removing PE-related directors). Abnormal performance (AP_{it}) is calculated as:$AP_{it} = P_{it} - E(P_{it})$. where, P_{it} is the actual performance in year t after SMBO transactions while $E(P_{it})$ is the expected performance of the target company in year t after SMBO transactions. It is estimated by two models: $E(P_{it}) = P_{i,t-k}$, and $E(P_{it}) = P_{i,t-k} + \Delta PI_{it}$; where, the former is 'level' model using unadjusted benchmark and the latter is 'change' model using industry adjusted benchmark. Panel A presents the results for the full sample while Panel B presents the results by PE backing. The Wilcoxon rank-sum test is used to test the null hypothesis of difference in median =0. ***, **, *, indicate significance of the test at the 1, 5, and 10 per cent levels, respectively.

Panel A: Full sample

		(1)	(2)	(3)
		OD	MGTCHAN	Remove PED
Profitability ratios	Benchmarks			
AROA	$E(P_{it}) = P_{it-k}$	0.008	-0.003	-0.012
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.01	0.007	-0.036
AROS	$E(P_{it}) = P_{it-k}$	0.007	0.012**	0.001
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.010*	0.009	0.006
Productivitys				
ASALEMP	$E(P_{it}) = P_{it-k}$	0.020**	0.005	0.006
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.017*	0.004	-0.02
Growth ratios				
AEMPG	$E(P_{it}) = P_{it-k}$	0.026*	-0.023	-0.063***
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.029**	-0.014**	-0.076***
ASALG	$E(P_{it}) = P_{it-k}$	0.072***	0.004	-0.059
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.073***	0.040*	-0.084**

[62] Only for the non-PE-backed SMBO subsample.

Panel B: PE vs. Non-PE-backed

		PE-backed		Non-PE-backed	
		(1)	(2)	(3)	(4)
		OD	MGTCHAN	OD	MGTCHAN
Profitability ratios	Benchmarks				
AROA	$E(P_{it}) = P_{it-k}$	0.010	-0.022	0.005	0.024**
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.004	-0.002	0.029	0.033
AROS	$E(P_{it}) = P_{it-k}$	0.006	0.01	0.007*	0.015**
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.006	0.01	0.015**	0.011
Productivity					
ASALEMP	$E(P_{it}) = P_{it-k}$	0.017	0.016	0.045**	-0.014
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.014	0.023**	0.019	-0.021
Growth ratios					
AEMPG	$E(P_{it}) = P_{it-k}$	0.026	-0.025	0.028	-0.006
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.037*	-0.035***	0.051*	0.023
ASALG	$E(P_{it}) = P_{it-k}$	0.049**	0.014	0.080**	0.011
	$E(P_{it}) = P_{it-k} + \Delta PI_{it}$	0.044**	0.051	0.117*	0.043

Table 3.6: Changes and characteristics of SMBO boards and post-SMBO performance-regression results

This table reports the results of the panel regression for the influence of board changes and characteristics on post-SMBO performance, up to five years after the SMBO. The dependent variables are abnormal performance in profitability (*AROA* and *AROS*), productivity (*ASALEMP*), employment growth (*AEMPG*), and sales growth (*ASALG*). Panel A uses unadjusted abnormal performance ('level' model), while Panel B uses industry adjusted abnormal performance ('change' model). The models in Panel A include entry year dummies and industry dummies and those in Panel B include entry year dummies.[63] The results are based on 99% winsorized data. All parameters are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. The coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N reports the number of firm-year observations used in the panel model. ***, **,* are significance at the 1%, 5%, and 10 % levels respectively. The variables are defined in Appendix 3.1.

Panel A: Unadjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
LNBS	-0.017	-0.001	-0.034	-0.100*	-0.021
	-0.669	-0.04	-1.337	-1.891	-0.262
PED (%)	0.233**	0.067	0.103*	0.340	0.396*
	2.501	0.739	1.781	1.554	1.826
Independent outsiders (%)	0.125	0.042	0.014	0.493**	0.375
	0.949	0.680	0.150	1.995	1.432
MGTCHAN	0.059	-0.008	0.016	0.003	0.124**
	1.004	-0.230	0.479	0.076	2.573
OD	-0.011	0.023	0.028*	0.080**	0.085*
	-0.479	1.171	1.651	2.309	1.688
MOD	-0.018	-0.030	-0.025	-0.091	0.109
	-0.597	-1.017	-0.346	-1.427	1.216
MGTSHARE	0.014	-0.064*	0.022	-0.087	0.116
	0.418	-1.796	0.673	-0.873	0.946
GEAR	-0.018**	-0.021***	0.003	0.002	0.004
	-2.250	-2.905	0.568	0.147	0.298
LNDURATION	-0.117	0.237**	0.045	0.230	0.101
	-1.032	1.963	0.276	1.329	0.623
LNSIZE	0.007	0.018	0.015	0.003	0.028
	0.564	0.740	0.769	0.156	1.100
Crisis	-0.015	-0.016**	0.006	-0.060**	-0.091***
	-1.058	-2.414	0.540	-2.434	-2.824
ROA t-1	-0.590***	-0.518**	-0.327	-0.160	-0.330
	-3.682	-2.524	-1.229	-0.868	-1.128
PE	-0.099	-0.057	0.044	-0.093	-0.107
	-1.618	-1.310	0.808	-1.342	-1.303
INTERCEPT	-0.908	-0.274	0.003	-0.033	-0.195
	-0.885	-0.884	0.009	-0.099	-0.566
Year dummy	YES	YES	YES	YES	YES
Industry dummy	YES	YES	YES	YES	YES
R-square (%)	14.1	9.44	5.71	7.83	8.55
Wald Chi2	53.491***	43.436**	77.612***	53.018***	57.847***
N	654	541	488	487	466

[63] The results for industry adjusted abnormal performance including both year dummies and industry dummies are very similar to the results without including industry dummies, except for the coefficient on *Independent outsiders* is significant in the model for *AEMPG* in the former model specifications.

Panel B: Industry adjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
LNBS	0.016	-0.019	-0.024	-0.064	-0.064
	0.384	-0.955	-0.774	-1.322	-0.769
PED (%)	0.248**	0.069	0.114*	0.332	0.422**
	2.492	1.082	1.722	1.427	2.009
Independent outsiders (%)	0.067	0.039	-0.082	0.376	0.295
	0.472	0.681	-0.687	1.381	0.96
MGTCHAN	0.049	0.011	0.011	-0.046	0.123**
	0.89	0.544	0.319	-1.310	2.35
OD	0.019	-0.006	0.037*	0.108***	0.112**
	0.671	-0.275	1.684	2.638	2.115
MOD	-0.047	0.011	-0.048	-0.035	0.120
	-1.251	0.553	-0.645	-0.604	1.425
MGTSHARE	-0.011	-0.028	0.054	-0.091	0.232*
	-0.144	-1.154	1.403	-1.229	1.775
GEAR	-0.015	-0.010***	0.008	-0.009	-0.003
	-1.609	-2.934	1.301	-0.76	-0.242
LNDURATION	-0.131	0.041	-0.093	0.296	0.015
	-1.128	0.634	-0.487	1.516	0.085
LNSIZE	-0.005	0.017	0.018	-0.023	0.030
	-0.479	1.630	0.956	-1.169	1.136
Crisis	0.004	-0.007	-0.022*	-0.089***	-0.049
	0.202	-1.146	-1.771	-3.158	-1.347
ROA t-1	-0.632***	-0.317***	-0.157	-0.159	-0.304
	-3.550	-3.176	-0.649	-1.251	-0.956
PE	-0.104	-0.038	0.017	-0.063	-0.078
	-1.592	-1.635	0.300	-0.972	-0.892
INTERCEPT	-1.005	-0.052	-0.132	-0.235	-0.489
	-0.942	-0.355	-0.383	-0.719	-1.203
Year dummy	YES	YES	YES	YES	YES
R-square (%)	12.25	9.09	7.33	8.75	6.37
Wald Chi2	47.720***	39.541***	285.013***	29.543*	47.191***
N	642	528	437	394	455

Table 3.7: Changes and characteristics of SMBO boards and post-SMBO performance -Dynamic panel GMM estimation

This table exhibits the results achieved by using dynamic panel GMM estimation for the relationship between changes and characteristics of SMBO boards and post-SMBO performance, up to 5 years after SMBO transactions. The dependent variables are estimated as unadjusted abnormal performance measures. *L. ARROA, L.ARROS, L.ASALEPG, L.AREMPG,* and *L.ARSALG* are lagged levels of *ARROA, ARROS, ASALEPG, AREMPG*, and *ARSALG*, respectively. The results are based on 99% winsorized data. AR (2) testifies second order serial correlation in the first-differenced residuals with the null hypothesis of no serial correlation. The Hansen test testifies whether all instruments are valid. N reports the number of firm-year observations used in the panel model. ***, **,* are significance at the 1%, 5%, and 10% levels respectively. The variables are defined in Appendix 3.1.

	AROA	AROS	ASALEMP	AEMPG	ASALG
LNBS	0.020	-0.213	0.050	-0.430	0.066
	0.117	-1.411	0.244	-1.639	0.122
PED (%)	-0.151	0.119	0.419	1.333	0.415
	-0.118	0.328	0.371	1.338	0.229
Independent outsiders (%)	-2.699	0.987	0.126	1.180	-2.497
	-0.532	0.867	0.098	0.487	-0.596
MGTCHAN	-0.947	-0.650	-2.403	-2.561	-4.739
	-0.155	-0.260	-1.109	-0.770	-0.398
OD	0.649	0.011	-0.006	-0.038	-0.087
	0.737	0.131	-0.008	-0.389	-0.102
MOD	-0.107	0.040	0.374	-0.146	0.219
	-0.175	0.119	0.338	-0.226	0.186
MGTSHARE	-0.202	0.085	0.110	0.035	-0.327
	-0.410	0.240	0.123	0.078	-0.144
GEAR	-0.006	-0.001	-0.004	0.019	0.015
	-0.095	-0.088	-0.123	0.679	0.491
LNDURATION	-5.171	-0.521	-0.209	-0.430	-10.519
	-0.670	-0.108	-0.055	-0.180	-0.446
LNSIZE	-1.031	0.102	-0.440	-0.472	-0.940
	-0.691	0.175	-0.268	-0.918	-0.383
Crisis	0.009	-0.040	0.038	-0.071	-0.065
	0.072	-0.920	0.142	-0.549	-0.579
ROA t-1	-18.336	1.096	3.439	-5.044	1.717
	-0.580	0.157	0.296	-0.580	0.148
PE	2.084	-0.366	1.369	1.459	1.447
	0.532	-0.201	0.580	0.609	0.265
L.AROA	0.006				
	0.013				
L.AROS		-0.243			
		-0.789			
L. ASALEMP			-0.110		
			-0.427		
L.AEMPG				-0.132	
				-0.810	
L.ASALG					0.008
					0.029
INTERCEPT	13.597	1.305	1.190	3.387	22.477
	0.675	0.122	0.132	0.685	0.441
F test	0.59	3.08***	0.66	0.64	0.34
Hansen (p-value)	1	0.811	0.389	0.216	0.415
AR(2) (p-value)	0.883	0.578	0.750	0.284	0.162
N	435	359	322	323	309

Table 3.8: Changes and characteristics of SMBO boards and post-SMBO performance-corrected for sample selection bias

This table reports the results of the panel regression corrected for sample selection bias for the influence of board changes and characteristics on post-SMBO performance, up to five years after an SMBO. The Probit regression with robust variance estimate is for the probability of receiving PE backing by the sample SMBOs. This model converged after three iterations. The panel regression is for the influence of the board changes and characteristics on post-SMBO performance. The dependent variables (*AROA*, *AROS*, *ASALEMP*, *AEMPG*, and *ASALG*) are estimated as unadjusted abnormal performance measures ('level' model). *Lambda1* is the fitted probability of receiving PE backing, estimated from the Probit regression model. All the results are based on 99% winsorized data. All parameters of panel regressions are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. Entry year dummies and industry dummies are included. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N reports the number of firm-year observations in the Probit regression model and the number of firm-year observations in the panel regression model, respectively. ***, **,* are significance at the 1%, 5%, and 10% levels respectively. The variables are defined in Appendix 3.1.

1st Step: Probit regression		**2nd Step: Panel regression**					
	PE		AROA	AROS	ASALEMP	AEMPG	ASALG
ROA t-1	0.279	LNBS	-0.017	-0.001	-0.034	-0.101*	-0.022
LNSIZE	0.601***		-0.669	-0.035	-1.32	-1.899	-0.27
BSERVICES	-0.145***	PED (%)	0.236**	0.056	0.102*	0.371*	0.414*
INTERCEPT	-1.061***		2.503	0.615	1.766	1.718	1.894
Log likelihood	-582.482	Independent outsiders (%)	0.13	0.035	0.012	0.552**	0.392
Pseudo R^2 (%)	29.19		0.972	0.574	0.132	2.293	1.506
Wald Chi2	383.80***	MGTCHAN	0.06	-0.014	0.015	0.008	0.128***
N	1270		1.013	-0.365	0.456	0.221	2.628
		OD	-0.01	0.025	0.028*	0.079**	0.084*
			-0.464	1.225	1.661	2.247	1.667
		MOD	-0.019	-0.028	-0.024	-0.091	0.108
			-0.631	-0.93	-0.333	-1.485	1.207
		MGTSHARE	0.016	-0.068*	0.02	-0.079	0.123
			0.46	-1.934	0.601	-0.786	1.002
		GEAR	-0.018**	-0.021***	0.003	0.001	0.003
			-2.269	-2.882	0.576	0.073	0.253
		LNDURATION	-0.137	0.273**	0.05	0.196	0.079
			-1.101	2.187	0.296	1.18	0.476
		LNSIZE	0.074	-0.06	0.015	0.078*	0.066
			1.292	-0.742	0.504	1.75	1.111
		Crisis	-0.015	-0.017**	0.006	-0.059**	-0.090***
			-1.05	-2.45	0.53	-2.409	-2.817
		ROA t-1	-0.495***	-0.630***	-0.317	-0.062	-0.279
			-3.518	-3.313	-1.143	-0.36	-0.95

(Continued)

	PE	-0.091	-0.063	0.053	-0.087	-0.104
		-1.618	-1.431	0.958	-1.248	-1.274
	Lambda1	0.251	-0.289	-0.029	0.283**	0.144
		1.221	-1.176	-0.414	1.965	0.718
	INTERCEPT	-1.207	0.037	-0.035	-0.355	-0.344
		-1.007	0.089	-0.094	-0.841	-0.85
	Year dummy	YES	YES	YES	YES	YES
	Industry dummy	YES	YES	YES	YES	YES
	R-square (%)	14.34	9.35	5.67	8.96	8.86
	Wald Chi2	56.249***	44.134**	75.823***	53.258***	58.905***
	N	654	541	488	487	466

Table 3.9: Changes and characteristics of SMBO boards and post-SMBO performance -corrected for PE-related directors selection bias

This table reports the results of panel regression for the influence of board changes and characteristics on post-SMBO performance, corrected for sample selection bias from PE-related directors, up to five years after the SMBO transactions. The Logit regression with robust variance estimate is for the probability of appointing PE-related directors onto the board. Panel regression is for the influence of board changes and characteristics on post-SMBO performance. The dependent variables (*AROA, AROS, ASALEMP, AEMPG,* and *ASALG*) are estimated as unadjusted abnormal performance ('level' model). *Lambda2* is the fitted probability of having PE-related directors, estimated from the Logit regression. All the results are based on 99% winsorized data. All parameters of panel regressions are estimated by a GLS random-effects model with a robust standard error and omitted collinear covariates. Entry year dummies and industry dummies are included. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N reports the number of firm-year observations in the Logit regression and number of firm-year observations in the panel regression, respectively. ***, **,* are significance at the 1%, 5%, and 10% levels respectively. The variables are defined in Appendix 3.1.

1st Step: Logit regression		**2nd Step: Panel regression**					
	Presence of PED		AROA	AROS	ASALEMP	AEMPG	ASALG
Club deals	0.301	LNBS	-0.019	-0.002	-0.035	-0.100*	-0.027
	0.840		-0.732	-0.059	-1.399	-1.89	-0.524
Top10	0.091	PED (%)	0.225**	0.062	0.098*	0.341	0.252**
	0.282		2.387	0.68	1.687	1.565	2.08
LNSIZE	0.379***	Independent outsiders (%)	0.121	0.04	0.011	0.503**	0.233
	4.373		0.979	0.666	0.123	2.141	1.269
PE	3.657***	MGTCHAN	0.07	-0.003	0.02	-0.001	0.078**
	8.971		1.21	-0.085	0.596	-0.017	2.127
GEAR	0.093	OD	-0.011	0.024	0.028*	0.079**	0.063*
	1.607		-0.523	1.196	1.688	2.281	1.916
MGTCHAN	-0.119	MOD	-0.019	-0.032	-0.029	-0.09	0.096
	-0.568		-0.659	-1.12	-0.384	-1.356	1.41
Crisis	0.235	MGTSHARE	0.022	-0.061*	0.021	-0.087	0.015
	1.110		0.676	-1.695	0.624	-0.863	0.207
ROA t-1	0.719	GEAR	-0.024**	-0.024**	0	0.003	0.009
	0.640		-2.526	-2.01	-0.003	0.256	1.18
INTERCEPT	-4.398***	LNDURATION	-0.105	0.251**	0.057	0.223	-0.002
	-10.838		-0.905	2.031	0.347	1.377	-0.018
Log likelihood	-278.916	LNSIZE	-0.018	0.005	0.002	0.011	0.024
Pseudo R^2 (%)	41.20		-0.534	0.122	0.09	0.246	0.807
Wald Chi2	186.994***	Crisis	-0.034*	-0.026	-0.003	-0.054	-0.056**
N	694		-1.681	-1.25	-0.211	-1.607	-2.192
		ROA t-1	-0.666***	-0.560***	-0.363	-0.138	-0.074

(Continued)

		-3.902	-2.856	-1.325	-0.708	-0.415
	PE	-0.482	-0.256	-0.151	0.027	0.116
		-1.067	-0.686	-0.596	0.044	0.315
	Lambda2	-0.127	-0.067	-0.065	0.039	0.071
		-0.836	-0.534	-0.835	0.205	0.584
	INTERCEPT	-0.387	-0.018	0.263	-0.191	-0.179
		-0.293	-0.032	0.575	-0.196	-0.353
	Year dummy	YES	YES	YES	YES	YES
	Industry dummy	YES	YES	YES	YES	YES
	R-square (%)	13.55	9.76	5.16	8.01	8.93
	Wald Chi2	72.581***	48.012**	76.231***	52.663***	90.508***
	N	654	541	488	487	466

Table 3.10: The impact of replacing top managers on post-SMBO performance-interaction with previous performance

This table presents the results of panel regressions (equation 1), after including an interactive variable between changing top managers and previous performance. The dependent variables are estimated as unadjusted abnormal performance ('level' model). *ROAt-1*MGTCHAN* is the interactive variable between changing the top managers (*MGTCHAN*) and previous performance (*ROAt-1*). The results are based on 99% winsorized data. All parameters are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. Entry year dummies and industry dummies are included. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N reports the number of firm-year observations used in the panel regression. ***, **,* are significance at the 1%, 5%, and 10% levels respectively. The variables are defined in Appendix 3.1.

	AROA	AROS	ASALEMP	AEMPG	ASALG
LNBS	-0.018	-0.001	-0.034	-0.100*	-0.021
	-0.71	-0.045	-1.337	-1.885	-0.263
PED (%)	0.233**	0.067	0.103*	0.341	0.398*
	2.501	0.736	1.786	1.556	1.834
Independent outsiders (%)	0.125	0.043	0.014	0.495**	0.374
	0.947	0.688	0.151	2.001	1.423
MGTCHAN	0.028	-0.012	0.009	-0.008	0.139*
	0.674	-0.162	0.146	-0.159	1.776
ROAt-1*MGTCHAN	0.262	0.028	0.050	0.081	-0.12
	0.693	0.078	0.116	0.266	-0.264
OD	-0.011	0.023	0.028	0.079**	0.087*
	-0.508	1.184	1.640	2.343	1.78
MOD	-0.018	-0.030	-0.025	-0.092	0.110
	-0.585	-1.016	-0.344	-1.428	1.212
MGTSHARE	0.014	-0.064*	0.022	-0.089	0.119
	0.423	-1.806	0.664	-0.874	0.958
GEAR	-0.018**	-0.021***	0.003	0.002	0.003
	-2.239	-2.908	0.573	0.157	0.291
LNDURATION	-0.123	0.237*	0.044	0.227	0.102
	-1.032	1.955	0.277	1.336	0.636
LNSIZE	0.006	0.018	0.014	0.003	0.029
	0.510	0.699	0.798	0.133	1.134
Crisis	-0.015	-0.016**	0.006	-0.060**	-0.091***
	-1.061	-2.414	0.538	-2.434	-2.822
ROA t-1	-0.707**	-0.529**	-0.353	-0.2	-0.277
	-2.306	-2.021	-0.775	-0.689	-0.619
PE	-0.101	-0.057	0.044	-0.093	-0.108
	-1.608	-1.287	0.841	-1.338	-1.320
INTERCEPT	-0.875	-0.272	0.009	-0.019	-0.206
	-0.877	-0.868	0.034	-0.056	-0.601
Year dummy	YES	YES	YES	YES	YES
Industry dummy	YES	YES	YES	YES	YES
R-square (%)	14.03	9.45	5.72	7.80	8.58
Wald Chi2	58.924***	43.486**	83.784***	58.362***	62.161***
N	654	541	488	487	466

Table 3.11: The impact of PE-related directors on PE-backed SMBOs' performance-interaction with PE firms' reputation

This table presents the results of panel regressions (equation 1) for the PE-backed subsample, after including an interactive variable between the fraction of PE-related directors and highly-reputed PE firms. The dependent variables are estimated as unadjusted abnormal performance ('level' model). *PED*Top10* is the interactive variable between the percentage of PE-related directors on the board (*PED*) and PE firms' reputation (*Top10*). The results are based on 99% winsorized data. All parameters are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. Entry year dummies and industry dummies are included. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N reports the number of firm-year observations used in the panel regression. ***, **,* are significance at the 1%, 5%, and 10% levels, respectively. The variables are defined in Appendix 3.1.

	AROA	AROS	ASALEMP	AEMPG	ASALG
LNBS	-0.007	0.019	-0.031	-0.091	-0.033
	-0.153	0.744	-1.054	-1.359	-0.438
PED (%)	0.197**	0.069	0.045	0.307	0.404*
	2.015	1.010	0.659	1.489	1.678
PED (%) *Top10	-0.056	-0.381***	0.187	-0.860***	-0.723*
	-0.212	-2.691	1.016	-2.63	-1.74
Independent outsiders (%)	0.218	0.089	-0.109	0.669**	0.332
	1.516	1.402	-0.932	2.251	0.953
MGTCHAN	0.059	0.029	0.048	-0.006	0.130**
	0.847	0.985	1.078	-0.117	2.110
OD	-0.045	0.006	0.036	0.097**	0.150**
	-1.198	0.476	1.425	1.996	2.414
MOD	0.009	-0.051*	0.005	-0.042	0.084
	0.184	-1.936	0.038	-0.603	0.561
MGTSHARE	0.016	-0.045	0.013	0.080	0.060
	0.331	-1.447	0.248	0.902	0.462
GEAR	-0.026***	-0.015***	0.003	-0.018	0.002
	-2.876	-3.041	0.437	-1.398	0.104
LNDURATION	-0.181	0.150*	0.273	0.207	0.075
	-1.299	1.756	1.326	1.043	0.328
LNSIZE	0.034*	0.029**	0.024	0.037	0.029
	1.771	2.159	1.265	1.591	1.034
Crisis	-0.042***	-0.015*	-0.005	-0.125***	-0.141***
	-3.159	-1.737	-0.342	-3.449	-3.523
ROA t-1	-0.884***	-0.490***	-0.742**	-0.321	-0.659
	-3.484	-3.391	-2.368	-1.209	-1.474
Top10	0.130	0.048	-0.125	0.193*	0.068
	0.875	1.262	-1.634	1.929	0.533
INTERCEPT	-1.736	-0.226	-0.314	-0.087	-0.171
	-1.016	-1.080	-0.924	-0.223	-0.383
Year dummy	YES	YES	YES	YES	YES
Industry dummy	YES	YES	YES	YES	YES
R-square (%)	22.22	20.79	16.47	15.47	16.88
Wald Chi2	77.466***	56.662***	49.768***	160.827***	78.296***
N	404	334	300	312	299

Table 3.12: The impact of removing PE directors on post-SMBO performance

This table presents the results of the impact of removing PE directors on post-SMBO performance for the non-PE-backed subsample, up to five years after SMBO, after including a dummy variable of the removal of the PE-related directors after SMBO transactions (*Remove PED*). The dependent variables are estimated as unadjusted abnormal performance measures ('level' model). The results are based on 99% winsorized data. All parameters are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. Entry year dummies and industry dummies are included. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi^2) are for probability > Chi^2. N reports the number of firm-year observations used in the panel model. ***, **,* are significance at the 1%, 5%, and 10% levels, respectively. The variables are defined in Appendix 3.1.

	AROA	AROS	ASALEMP	AEMPG	ASALG
LNBS	-0.016	-0.019	-0.061	0.003	0.063
	-0.605	-0.766	-1.139	0.036	0.274
Remove PED	0.038	-0.068	0.007	-0.028	0.056
	1.042	-1.187	0.138	-0.445	0.460
Independent outsiders (%)	-0.214	-0.046	0.286	-0.157	0.395
	-1.586	-0.563	1.608	-0.471	0.678
MGTCHAN	0.009	-0.115*	-0.018	0.083	0.113
	0.294	-1.959	-0.317	1.200	1.383
OD	0.024	0.001	0.010	0.002	-0.110
	1.114	0.049	0.368	0.06	-1.121
MOD	-0.058	0.020	-0.049*	-0.156	0.122
	-1.067	1.553	-1.846	-1.621	0.978
MGTSHARE	0.059	-0.046	0.022	-0.311	0.282
	1.267	-1.615	0.487	-1.383	0.895
GEAR	-0.003	-0.018***	0.002	0.063**	-0.002
	-0.188	-3.45	0.314	2.442	-0.074
LNDURATION	0.057	0.179	-0.387*	0.230	-0.163
	0.502	1.154	-1.685	0.828	-0.746
LNSIZE	-0.017	0.006	0.002	-0.087*	-0.007
	-1.146	0.205	0.046	-1.883	-0.161
Crisis	0.013	-0.020*	0.019	0.035	-0.007
	0.492	-1.926	0.851	1.417	-0.120
ROA t-1	-0.271	-0.569*	0.508	0.044	-0.01
	-1.639	-1.96	1.296	0.202	-0.025
INTERCEPT	-0.176	-0.158	0.780*	-0.182	-0.098
	-0.763	-0.519	1.665	-0.280	-0.136
Year dummy	YES	YES	YES	YES	YES
Industry dummy	NO[64]	YES	YES	NO	YES
R-square (%)	19.35	17.96	11.80	21.23	3.76
Wald Chi2	38.071***	1240.022***	4696.099***	108.387***	52.451***
N	250	207	188	175	167

[64] When we include industry dummies, Stata does not present Wald Chi2. However, with or without industry dummies, the results are qualitatively similar.

Table 3.13: **Changes and characteristics of SMBO boards and post-SMBO performance - early vs. late exit**

This table presents the results of panel regressions (equation 1) that examine the relations of changes and characteristics of SMBO boards and post-SMBO performance for 'early' and 'late' exit subsamples of SMBOs, up to five years after SMBO transactions. Panel A and Panel B report the results for 'early' and 'late' exit subsamples respectively. The 'early' exit subsample includes SMBOs with a primary holding period of less than three years. The 'late' exit subsample includes SMBOs with a primary holding period equal to or longer than three years. The dependent variables are estimated as unadjusted abnormal performance measures. The results are based on 99% winsorized data. All parameters are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N reports the number of firm-year observations used in the panel model. ***, **,* are significant at the 1%, 5%, and 10% levels respectively. The variables are defined in Appendix 3.1.

Panel A: Early exit

	AROA	AROS	ASALEMP	AEMPG	ASALG
LNBS	-0.051	-0.077	-0.013	0.043	-0.255
	-0.732	-0.803	-0.118	0.333	-1.030
PED (%)	0.153	-0.294	0.303	0.732*	0.210
	0.934	-0.969	0.568	1.798	0.274
Independent outsiders (%)	-0.339	0.069	0.207	2.144**	1.898*
	-0.969	0.149	0.372	2.309	1.840
MGTCHAN	0.098**	-0.061	0.040	0.125	0.366**
	2.105	-0.610	0.303	0.554	2.150
OD	0.093***	0.090	-0.075	0.261**	0.028
	2.621	0.953	-1.217	2.319	0.216
MOD	-0.003	-0.015	-0.299*	0.209	0.822***
	-0.071	-0.120	-1.777	0.556	2.669
MGTSHARE	-0.062	-0.022	0.289	0.489*	0.148
	-0.523	-0.195	1.502	1.782	0.421
GEAR	-0.023	-0.020	0.009	-0.009	0.018
	-1.346	-0.977	1.259	-0.858	0.954
ROA t-1	-0.595***	-1.205***	-0.272	-0.554	-0.603
	-3.151	-3.108	-0.574	-0.713	-0.843
LNDURATION	0.412*	0.689**	0.087	1.002	-0.931
	1.867	2.065	0.205	0.835	-1.435
LNSIZE	-0.032*	0.062*	0.052	0.048	0.069
	-1.838	1.660	0.891	0.476	1.070
Crisis	0.002	0.017	0.005	-0.061*	-0.175
	0.047	0.408	0.119	-1.657	-1.351
PE	0.031	-0.105	-0.034	0.199	0.141
	0.332	-0.866	-0.164	0.451	0.648
INTERCEPT	-0.501	-0.825	-0.364	-2.717	1.380
	-1.028	-1.508	-0.418	-1.252	1.022
R-square (%)	33.56	37.70	19.94	7.27	43.43
Wald Chi2	31.908***	49.389***	11.164	74.778***	230.150***
N	87	83	79	73	70

Panel B: Late exit

	AROA	AROS	ASALEMP	AEMPG	ASALG
LNBS	0.009	0.005	-0.021	0.013	0.006
	0.273	0.100	-0.606	0.360	0.149
PED (%)	0.179*	0.051	0.015	0.219***	0.137**
	1.778	0.442	0.254	2.730	2.161
Independent outsiders (%)	0.321	0.001	-0.010	0.117	0.124
	1.247	0.010	-0.064	0.997	0.887
MGTCHAN	0.061	-0.008	0.002	-0.029	-0.021
	0.650	-0.154	0.064	-1.135	-0.817
OD	0.001	-0.008	0.051**	-0.029	0.008
	0.025	-0.455	2.575	-1.000	0.226
MOD	-0.046	-0.025	0.085	0.018	0.099
	-1.341	-0.760	1.481	0.383	1.186
MGTSHARE	-0.024	-0.032	-0.048	-0.053	-0.007
	-0.484	-0.706	-0.845	-1.086	-0.155
GEAR	-0.018	-0.024**	0.002	0.006	0.005
	-1.397	-2.349	0.363	0.871	0.810
ROA t-1	-0.595**	-0.559*	0.101	-0.067	-0.186
	-2.097	-1.869	0.310	-0.592	-1.288
LNDURATION	-0.766	0.068	-0.096	-0.020	-0.016
	-1.303	0.486	-0.625	-0.213	-0.167
LNSIZE	-0.001	-0.009	-0.021	-0.015	-0.018
	-0.077	-0.307	-1.015	-1.540	-1.357
Crisis	-0.010	-0.021**	0.006	-0.026	-0.006
	-0.491	-2.042	0.308	-1.489	-0.300
PE	-0.197*	-0.035	0.086	-0.052	-0.023
	-1.696	-0.543	1.515	-1.303	-0.512
INTERCEPT	1.421	0.100	0.240	0.093	0.055
	1.510	0.388	0.929	0.461	0.283
R-square (%)	6.85	3.89	9.40	4.37	5.54
Wald Chi2	26.200**	20.853*	21.239*	21.647*	24.297**
N	360	284	256	273	256

Table 3.14: Tested-down results

This table reports the results of the test-down method for regressions in Panel A of Table 3.6. The dependent variables are estimated as unadjusted abnormal performance measures. The results are based on 99% winsorized data. All parameters are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N reports the number of firm-year observations used in the panel regression. ***, **,* are significance at the 1%, 5%, and 10 % levels, respectively. The variables are defined in Appendix 3.1.

	AROA	AROS	ASALEMP	AEMPG	ASALG
LNBS				-0.105*	
				-1.95	
PED (%)	0.207**		0.095*	0.303*	0.242*
	2.34		1.9	1.69	1.72
Independent outsiders (%)				0.51**	
				2.06	
MGTCHAN					0.087**
					2.36
OD				0.054*	0.091***
				1.92	2.97
MOD					
MGTSHARE					
GEAR	-0.018**	-0.02***			
	-2.48	-2.89			
ROAt-1	-0.683***	-0.479**			
	-3.02	-2.51			
LNDURATION		0.209*			
		1.78			
LNSIZE					
Crisis		-0.019**		-0.044**	-0.067***
		-2.51		-1.98	-2.94
PE					-0.086*
					-1.67
INTERCEPT	0.142***	-0.216	0.037**	0.235***	-0.004
	2.8	-0.8	2.01	2.81	-0.21
Year dummy		Yes			Yes
Industry dummy	Yes	Yes		Yes	
R-square (%)	6.58	7.92	0.002	4.07	4.56
Wald Chi2	37.17***	36.45***	3.63*	29.27***	36.35***
N	668	552	491	487	466

Appendix 3.1: Definition of variables

Description	*Variable*	Definition
		Performance measures
Profitability		
Return on assets	*ROA*	Earnings before interests and taxes (*EBIT*) scaled by total assets. *AROA* is abnormal *ROA*.
Return on sales	*ROS*	Earnings before interests and taxes (*EBIT*) scaled by total sales. *AROS* is abnormal *ROS*.
Productivity		
Sales efficiency	*SALEMP*	The logarithm value of inflation adjusted sales scaled by the number of employees. *ASALEMP* is abnormal *SALEMP.*
Growth		
Employment growth	*EMPG*	The difference between the number of employee in year t and year t-1 scaled by their average value. *AEMPG* is abnormal *EMPG*.
Sales growth	*SALG*	The difference between sales in year t and year t-1, scaled by average sales in year t and t-1. *ASALG* is abnormal *SALG*.
		Board of directors and change in top management
Board size	*BS*	The number of directors on the relevant board in year t.
	LNBS	The natural logarithm of *BS*.
Change in top management	*MGTCHAN*	A dummy variable which equals 1 if the CEO and/or CFO is replaced within three years after the relevant SMBO transaction year, and 0 otherwise.
The percentage of inside directors	*Insiders*	The number of insider directors divided by board size in year t.
The percentage of PE-related directors on the board	*PED*	The number of outside directors who have an observable relationship with PE firms divided by board size in year t.
The percentage of independent outsiders	*Independent outsiders*	The number of independent outside directors divided by board size in year t.
The percentage of other directors	*Others*	The number of other directors divided by board size in year t.
Inside directors with independent outside directorships (skilled insiders)	*OD*	A dummy variable that equals 1 if the SMBO with inside directors that are employed by at least one unaffiliated companies in year t and 0 otherwise.
Removing PE-related directors from the board.	*Remove PED*	A dummy variable that equals 1 if the non-PE-backed SMBO removes the PE specialists from the boards in SMBO transaction year and 0 otherwise.
		Control variables
Management share	*MGTSHARE*	The percentage of target company's common equity contributed by the management in year t.
Leverage	*GEAR*	The sum of long term and short term debt divided by the total equity in year t..
Busy directors	*MOD*	A dummy variable that equals 1 if SMBOs with inside directors that are employed by at least three unaffiliated companies in year t and 0 otherwise.
Business service industry	*BSERVICES*	Dummy variable equals 1 for SMBOs from Business Service industry and 0 otherwise.
PE backing	*PE*	Dummy variable equals 1 if the SMBO received PE backing and 0 otherwise.
Syndicated SMBOs	*Club deals*	Dummy variable that equals 1 if there is more than one PE firm investing in a given SMBO, and 0 otherwise.

(Continued)		
Backed by highly- reputed PE firms	*Top10*	A dummy variable which equals 1 if an SMBO is backed by PE firms that are top 10 PE firms in the reputation ranking list and 0 otherwise.
Companies' size	*SIZE*	SMBO value in £ million.
	LNSIZE	The logarithm of *SIZE*.
Financial crisis	*Crisis*	A dummy variable which equals 1 for observations from 2008-2010.
Pre-SMBO performance	*ROA t-1*	The performance ratio in the form of *ROA* in year preceding the SMBO.
Longevity of buyouts	*LNDURATION*	The logarithm of the number of months from the SMBO date to the exit date, if the SMBO was exited; or the number of months from the SMBO date to the sample's cut-off date (31/12/2010), if the SMBO was not exited.
Lambda	*Lambda1*	The fitted probability of receiving PE backing, estimated by equation 3.
	Lambda2	The fitted probability of having PE-related directors on the board, estimated by equation 5.

Appendix 3.2: Changes and characteristics of SMBO boards and post-SMBO performance- using management ownership participant dummy variable

This table reports the results of panel regression for the influence of board changes and characteristics on post-SMBO performance, up to five years after SMBO transactions, with a dummy variable for management ownership participant to proxy for managerial ownership. The dependent variables are unadjusted abnormal performance in profitability (*AROA* and *AROS*), productivity (*ASALEMP*), employment growth (*AEMPG*), and sales growth (*ASALG*). Models include entry year dummies and industry dummies. The results are based on 99% winsorized data. All parameters are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N reports the number of firm-year observations used in the panel regression. ***, **,* are significance at the 1%, 5%, and 10 % levels respectively. The variables are defined in Appendix 3.1.

	AROA	AROS	ASALEMP	AEMPG	ASALG
LNBS	-0.017	-0.004	-0.032	-0.102*	-0.019
	-0.654	-0.129	-1.269	-1.906	-0.234
PED (%)	0.233**	0.065	0.103*	0.353*	0.384*
	2.509	0.727	1.809	1.649	1.758
Independent outsiders (%)	0.126	0.044	0.013	0.503**	0.352
	0.953	0.697	0.135	2.014	1.350
MGTCHAN	0.059	-0.007	0.015	0.003	0.121**
	1.004	-0.188	0.477	0.082	2.552
OD	-0.011	0.021	0.029*	0.077**	0.091*
	-0.493	1.026	1.740	2.142	1.710
MOD	-0.018	-0.028	-0.028	-0.082	0.093
	-0.572	-0.935	-0.391	-1.384	1.054
Management share participant	-0.011	-0.032	0.044	-0.016	0.049
	-0.297	-0.611	0.627	-0.235	0.540
GEAR	-0.018**	-0.020***	0.003	0.003	0.003
	-2.368	-2.775	0.559	0.224	0.215
LNDURATION	-0.116	0.228*	0.050	0.224	0.120
	-1.030	1.919	0.299	1.302	0.748
LNSIZE	0.005	0.020	0.016	0.008	0.023
	0.422	0.874	0.798	0.426	0.935
Crisis	-0.015	-0.016**	0.006	-0.060**	-0.091***
	-1.080	-2.352	0.546	-2.398	-2.815
ROAt-1	-0.586***	-0.512***	-0.342	-0.156	-0.343
	-3.667	-2.607	-1.228	-0.819	-1.147
PE	-0.106	-0.042	0.044	-0.067	-0.131*
	-1.539	-1.012	0.837	-0.989	-1.901
INTERCEPT	-0.889	-0.267	-0.041	-0.072	-0.196
	-0.880	-0.908	-0.126	-0.209	-0.517
Year	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES
R-square (%)	13.96	10.15	6.03	7.72	8.60
Wald Chi2	53.242***	41.754**	74.426***	54.536***	57.129***
N	654	541	488	487	466

Appendix 3.3: Implementing dynamic GMM estimation in Stata

Following Wintoki et al. (2012), we implement command *xtabond2* to run dynamic panel GMM estimation. Using AROA as an example, the command is as follows:

xtabond2 *AROA l.AROA LNBS PED Independent outsiders MGCCHAN OD MOD MGTSHARE GEAR LNDURATION LNSIZE Crisis ROAt-1 PE*, gmm(*AROA LNBS PED MGCCHAN OD MOD MGTSHARE GEAR LNDURATION LNSIZE ROAt-1 PE*, lag(1 5)collapse) iv(*Crisis*) twostep robust small

Where, *l.AROA* is the lagged dependent variable of *AROA*. The gmm(varlist) includes all endogenous variables and our lagged instrumental variables, while iv(varlist) includes all strictly exogenous variables. lag (1 5) indicates we wish to include 5 lags from the most recent lag (the first lag) to the most distant lag (the fifth lags). We use the "collapse" to avoid instrument proliferation. ''small'' requests t statistics instead of z-statistics and an F test instead of a Wald chi-squared test of overall model fit.

Appendix 3.4: Changes and characteristics of SMBO boards- median values

This table shows changes in board size and board composition. Presented values are median values of each variable three years pre- and five years post- SMBO transactions. Difference values are calculated as post-SMBO median value of each variable minus its pre-SMBO median value. We used Wilcoxon rank-sum (Mann Whitney) test for differences in median abnormal performance measures. The signs of '0's are the signs of Z-score from Wilcoxon rank-sum (Mann Whitney) test. All variables are defined in Appendix 3.1. *, **, ***, are significant at the 10%, 5%, and 1% levels respectively.

	No. of observations	*Full sample*			*PE backing (median)*					
		Median			*PE*			*Non- PE*		
		Post	*Pre*	*Difference*	*Post*	*Pre*	*Difference*	*Post*	*Pre*	*Difference*
BS (N)	*1832*	*5*	*5*	*-0*	*5*	*5*	*+0**	*4*	*5*	*-1****
Insiders (%)	*1832*	*80*	*77.78*	*2.22*	*66.667*	*75*	*-8.333****	*100*	*83.333*	*16.667****
PED (%)	*1832*	*0*	*0*	*+0****	*20*	*0*	*20****	*0*	*0*	*-0****
Independent outsiders (%)	*1832*	*0*	*0*	*-0****	*0*	*0*	*-0*	*0*	*0*	*-0****
Others (%)	*1832*	*0*	*0*	*-0****	*0*	*0*	*-0****	*0*	*0*	*-0****

Appendix 3.5: Comparison of variables between early and late

This table presents the differences in median values of non-dummy variables used in the regression between early and late subsamples. N1 of early subsample and N2 of late subsample are the numbers of firm-year observations for time-variant variables or the numbers of SMBOs for time-invariant variables. Presented values of dummy variables (Crisis, PE, OD, MOD, and MGTCHAN) are percentage values in each subsample. Significant levels are results from Wilcoxon rank-sum (Mann Whitney) test and test of proportions. *, **, ***, are significant at the 10%, 5%, and 1% levels, respectively.

	Early	N1	Late	N2	Differences
AROA	-0.018	125	-0.023	461	0.005
AROS	-0.012	110	0.003	356	-0.015
ASALEMP	0.002	103	0.032	325	-0.030**
AEMPG	-0.1	86	-0.033	328	-0.067
ASALG	-0.083	83	-0.042	294	-0.041
BS (N)	6	164	5	588	1**
PED	0.2	164	0.143	588	0.057**
Independent outsiders	0	164	0	588	+0**
MGTSHARE	0.525	115	0.468	469	0.057
GEAR	0.525	97	0.926	404	-0.401***
ROAt-1	0.105	40	0.108	140	-0.003
LNDURATION	1.672	41	1.724	144	-0.052**
LNSIZE	3.628	41	3.237	144	0.391**
Crisis (%)	0.732	41	0.618	144	0.114***
PE (%)	0.829	41	0.792	144	0.037
OD (%)	0.232	164	0.172	588	0.060*
MOD (%)	0.104	164	0.041	588	0.063***
MGTCHAN (%)	0.413	164	0.483	588	-0.070

CHAPTER 4

SMBOS' PERFORMANCE – INCENTIVES AND CHARACTERSTICS OF PE FIRMS

4.1 Introduction

The traditional buyout literature documents that PE firms improve the performance of buyouts. PE firms conduct due diligence to select promising deals. Later, PE firms play a hands-on role in the target companies to enhance their performance via superior governance, intensive monitoring, and providing advice (Kaplan and Strömberg, 2009). Some PE firms have competitive advantages due to their own experience, knowledge, and professional networks. The competitive advantages strengthen the PE firms' impact on the performance and growth opportunities. However, empirical evidence on the performance of PE firms' characteristics and reputation comes only from the datasets that treat all buyouts the same (e.g. Cressy et al., 2007; Acharya et al., 2013). Little is known, theoretically and empirically, about the impact of PE firms' on the operating performance of different types of buyouts (e.g. private to private buyouts).

Recent evidence highlights the importance of PE funds' longevity on their incentives (Jenkinson and Sousa, 2014). For instance, funds could exit the primary buyouts early, either to build a reputation or to beautify its investment performance for the next round of fundraising. Sometimes, funds with huge untapped committed capital could be compelled to invest in new deals when a PE fund is approaching the end of investment period. An SMBO is a convenient way to relieve the above-mentioned selling and buying pressures on PE funds (Wang 2012; Bonini, 2013).

All previous studies measure the PE funds' longevity (fund pressures) on

performance of SMBOs based on fund data (i.e. IRR) (Arcot et al., 2014; Degeorg et al., 2013). There is therefore a paucity of research that utilizes company level data to investigate this relationship. There has also been very little research on the importance of PE firms' characteristics for SMBO performance.[65]

The purpose of this chapter is to fill these gaps by investigating the importance of PE firms' characteristics for the SMBOs performance measured at the level of portfolio companies. We firstly examine potential conflicts of interest between general and limited partners. These agency conflicts could lead to overinvestment or adverse effects on investment such as investing in bad deals (Axelson et al., 2013). Second, we examine how differences among PE firms affect SMBO performance. For example, we expect that PE firms with some competitive advantages (e.g. previous experience) would bring extra improvement in SMBO performance. Although some studies suggest that heterogeneity matters in influencing the success of buyouts (e.g. De Clercq and Dimov, 2008; Bottazzi et al., 2008), little is known about how exactly the differences in PE firms' characteristics influence target companies' operating performance.

The reminder of this chapter is structured as follows. Section 4.2 proposes main hypotheses. This is followed by Section 4.3 that describes the data and provides summary statistics of our sample. Section 4.4 shows the results of post-SMBO performance. Section 4.5 outlines the multiple regressions and reports the main empirical results. Section 4.6 concludes.

4.2 Hypotheses development

4.2.1 Longevity of PE funds and performance of SMBOs

When a fund is approaching the end of investment period with significant uninvested

[65] To the best of our knowledge, Jenkinson and Sousa (2013) is the only exception.

funds (i.e. dry powder), general partners (GP) tend to be under pressure to invest. If they fail to invest, GPs would lose certain fixed fees and could be viewed as incompetent. In the above circumstance, SMBOs would be a more attractive investment compared to primary buyouts, as their searching and due diligence costs tend to be much lower (i.e. some work should already have been done by selling PE firms). Furthermore, SMBOs are faster and more convenient to complete especially when selling PE firms may be under pressure to exit. Concurrently, however, buying GPs could end up with lemons (i.e. bad deals) for two reasons. First, buying GPs would rely on the due diligence conducted by the selling PE firms. The reductions in the overall due diligence cost could sometimes lead to bad choices. Moreover, selling PE firms would have an informational advantage and may try to sell portfolio companies that perform badly or have no value creation potential. Thus:

H1a: A longer (shorter) remaining time of investment period of the buying PE fund generates a significantly better (worse) post-SMBO performance.

H1b: A longer (shorter) remaining time of investment period of the buying PE fund is more likely to generate a better (worse) post-SMBO performance when accompanied by dry powder.

With respect to the incentives of selling PE funds, their GPs have to collect all the invested capital back and receive the returns within the funds' prescribed life. As such funds are reaching the end of their lives, they may be under pressure to exit some of their investments fairly quickly (e.g. via SMBO). Arcot et al., (2014) suggest that some good buyouts could be exited via SMBO fairly late. The main reason could be associated with lower exit costs compared to other exit routes (e.g. IPOs).[66] Thus:

H1c: A longer (shorter) remaining time of fund life of the selling PE fund generates

[66] On the other hand, it is possible that the only investments remaining on their books are those of poor quality or those where substantial improvements have already been made leaving very little potential for further improvement.

a significantly worse (better) post-SMBO performance.

4.2.2 The impact of PE firms on SMBO performance

4.2.2.1 Industry experience

PE firms either diversify their investments in different industries or specialize in a given industry (Norton and Tenenbaum, 1993). The accruing investments in a given industry create more comprehensive understanding and deeper knowledge of the industry and form the competitive advantage of the PE firms. Gompers et al. (2008), for example, demonstrate that compared to general experience, industry-specific experience is more important for achieving investment success. This competitive advantage facilitates effective value creation in the target companies (Cressy, et al., 2007) and the success of investments (De Clercq and Dimov, 2008) by providing better expert advice, industry network contacts, and recruiting more competent management.

4.2.2.2 Number of investments per executive manager

The number of investments managed by one executive (Elango et al., 1995) and the intensity of monitoring (Meuleman et al., 2009) vary across PE firms. As discussed in section 1.7.3, a lower number of investments per an executive manager is expected to be positively associated with improvements in post-SMBO profitability and growth.

4.2.2.3 Stage specialization

PE firms can also differ significantly with respect to their preferences regarding the different development stages of target companies (e.g. Robinson, 1987; Elango et al., 1995).[67] Not only do different stages require different investment and governance strategies (Elango et al., 1995), but different PE firms are also specialized in different stages. The

[67] For example, early stage and late stage as in Elango et al. (1995).

resource-based view of competitive advantage points out that the valuable, rare, imperfect imitable and substitutable resources can create sustained competitive advantages due to their heterogeneity and immobility (e.g. Barnery, 1991; Peteraf, 1993). According to this view and our discussion in literature review (please see section 1.7.3), PE firms specialized in a particular stage can experience the process of accumulating these valuable, rare, imperfect imitable and substitutable resources and gain a competitive advantage related to this stage. This competitive advantage comes from a deeper understanding of the stage which should help PE firms make better investment decision and/or help them reduce the business risk by monitoring the target companies more efficiently (Manigart et al., 2002; Cressy, et al., 2007).

PE firms utilize their alternative specialist skills, experience, knowledge, and resources (competitive advantages) to exploit growth opportunities and create value in SMBOs (Arcot et al., 2014; Jenkinson and Sousa, 2013). More experienced PE firms with greater and wider resource networks may be able to figure out the opportunities, when less experienced PE firms cannot obtain further value creation. This supports the view that buying PE firms could be superior to selling PE firms in terms of one or more competitive advantages. Based on these advantages, buying PE firms can exploit new opportunities to improve performance *(Heterogeneity hypothesis)*. Hence:

H2: More industry experience, fewer investments per executive, and a focus on buyout/acquisition stages stage investments of buying PE firms lead to better post-SMBO performance.

It is also possible that some PE firms lack competitive advantages to access promising buyout deals. This view is consistent with the findings that buying PE firms tend to be younger (Jenkinson and Sousa, 2014), less experienced (Jenkinson and Sousa, 2013),

and less reputable (Arcot et al., 2014). The older, more experienced or more reputable selling PE firms effectively create value in the primary round and exit via SMBO only when further improvements become costly and more difficult. The above scenario is even more likely in periods of cheap debt and a lack of primary buyout deals. With easier access to debt and fierce competition for primary buyouts, some PE firms prefer SMBOs that still offer some potential for improvement.

4.3 Data

4.3.1 Data and sample selection

We identified SMBOs from the Centre for Management Buyout Research (CMBOR) list. We then searched for news about the buyouts from Nexis UK, http://www.unquote.com/, http://www.ft.com/, http://www.growthbusiness.co.uk/, PE firms' websites, target companies websites, and synopses available from Thomson One Banker. Usually these sources of news and synopses describe the transaction and provide names of buyers and sellers, especially PE firms. In this way we can obtain entry dates of primary buyouts, selling and/or buying PE firms, and buyout types. [68]

We obtained target companies' former and current names from the FAME database. We collected company accounting information by combining the information on transactions obtained in the previous steps and merger and acquisition synopses from FAME database.

SMBOs could be syndicated by several PE firms (club-PE deals). In such cases, there is a lead PE firm that launches the transaction and dominates the decision-making process. We assume that the lead PE firm's behavior is consistent with that of its syndicate

[68] This process helps us also to exclude SMBOs that are non PE-baked in both primary and secondary stages due to the purpose of this chapter.

partners and, hence, consider the lead PE firm as the delegate of the club-PE deals. PE firms' reputation scores are estimated as the average of the sum of total number of investments and firms' market share in PE total equity funding.[69]

We also checked PE firms' websites and the shareholder list from the annual returns of target companies to obtain the exact fund names that invest in SMBOs. We excluded deals in cases where we were unable to find fund names, when we examine fund pressures.[70] These unspecified funds could be 'green funds' with an unlimited fund life.[71] They may not have the same sell pressure and buy pressure as funds with a limited lifespan. Second, in some cases, the lead PE firm invests in several funds, with different vintage years simultaneously.[72] For instance, 3i invested in 6 funds in HSS Hire Service Group, where the oldest fund has a vintage year of 1989 and the youngest fund has a vintage year of 2003. We computed the average value of the vintage years of the funds by the same PE firm simultaneously in one target company as our target vintage year. The final sample consists of 227 UK SMBOs from 2000 to 2007, of which 169 SMBOs were sold by PE firms to PE firms[73].

Panel A of Table 4.1 describes the SMBO sample distribution in terms of the PE firms involved. We listed selling and buying PE firms, sorted by the number of SMBOs. There are more PE firms (82) on the buying side, compared to those on the selling side (63). Furthermore, deals seem to be concentrated on several large PE firms on the selling side, while deals seem to be dispensed across more PE firms on the buying side. For instance, 3i sold 41 deals but only bought out 7 deals. Similarly, Bridgepoint sold 15 deals while it only

[69] Reputation score = ½*(number of total investments) + ½*(the market share of total equity funding in £m).
[70] 16 SMBOs in terms of selling funds and 28 SMBOs in terms of buying funds.
[71] For instance, Royal Bank Development Capital Ltd - Unspecified Fund, Dubai International Capital - Unspecified Fund, Lloyds Development Capital (Hldg), Ltd. - Unspecified Fund, and Bank of Scotland Corporate- Unspecified Fund.
[72] There are 11 deals in the selling side and 18 deals in the buying side with multiple funds from the same lead PE firm.
[73] Please see Appendix 4.1 for sample selection filters.

bought out 6 deals. The results for sample distribution in terms of buyout types (Panel B) and fund vintage years (Panel C) suggest that MBOs account for 63.44% (144 SMBOs) of the total sample SMBOs, followed by IBO (27.31% / 62 SMBOs). BIMBO and MBI only account for small portions. The vintage year of the selling PE funds ranges from 1975 to 2005. Most funds were raised during the 1990s-2000s period. The majority of the selling PE funds was originated in 1996. The vintage year of the buying PE funds ranges from 1986 to 2007. The majority of the buying funds (82.88%) were originated in the 2000s. The majority of buying PE funds were raised.

Insert Table 4.1 about here

4.3.2 Descriptive statistics

Table 4.2 (Panel A) shows a summary of the characteristics of selling and buying PE firms and funds. With respect to the selling side, the average industry experience of lead PE firms up to SMBO transaction year is about 24 investments, while the median is 9 investments. On average, each executive manages about 6 investments. The mean fund age of selling funds, up to the SMBO transaction year, is around 9 years. This result suggests that selling funds tend to be close to the end of their lives.

With regard to the buying side, the mean value of industry experience is 18 investments, with a median value of 10 investments. The executive only manages about 4 investments. The average fund age is 4 years (median is 3 years), suggesting the buying funds tend to be in investment period. The proxy for dry powder indicates that buying funds have significant capital available at the SMBO transaction years.[74] On average, there is 68.10% of raised fund that is not invested by the SMBO transaction year. In addition, both

[74] Dry powder is estimated as one minus the percentage of the sum of invested funds up to SMBO transaction year in the total raised fund. In regressions, we use the logarithm of dry powder.

selling and buying firms have similar mean and median values of stage specialization [75] and PE independence.[76] For example, 94.8% of selling PE firms and 88.4% of buying PE firms on average are specialized in buyout/acquisition stage.

Insert Table 4.2 about here

We also compare the characteristics of the selling and buying PE firms and funds by the mean values of relevant variables (Panel B). The results are presented in Panel B. Buying PE firms have less industry experience, compared to selling PE firms, although the difference is not statistically significant. The executives from buying PE firms have significantly smaller loads than those from selling PE firms. As expected, the buying funds are much younger than the selling funds. When we compare the median values (Panel C) of those characteristics, the results are similar, except that buying PE firms insignificantly show more industry experience than selling PE firms.

Table 4.3 presents the main deal characteristics of our SMBO sample. The average holding period (duration) in the primary stage is about 61 months (about 5 years), while that in secondary stage is slightly shorter with about 52 months (about 4 years) (Panel A). The percentages of PE-backed deals in both stages are similar, with 84.6% in the primary stage and 89.9% in the secondary stage. In addition, about 22.3% SMBOs were invested through multiple investment rounds and 16% SMBOs were invested by more than one PE firms.

The summary statistics of the target company characteristics are presented in Panel

[75] Stage specialization is defined according to Cressy et al. (2007), we calculate the percentage of investments (number of companies) of lead PE firms up to 2013 in 6 stage types: seed, early-stage, expansion, later stage, buyout/acquisition, and other. One stage with the greatest share of investments will be the stage that the lead PE firm is specialized in. We then create a dummy (named as stage specialization) that equals to 1 when the lead PE firm is specialized in buyout/acquisition stage, and 0 otherwise.

[76] PE independence is defined as a dummy variable that takes value of 1 when the selling (buying) PE firm is not the affiliation of bank or insurance companies in the primary buyout (SMBO) transaction year, and 0 otherwise.

B[77]. The mean and median values of size (*LNSIZE*) are 4.335 (about £ 21.627 million) and 4.293 (about £ 19.634 million). Moreover, the sizes of 75% of the SMBOs in our sample are less than 4.675 (about £47.315 million). It is evident that the majority of SMBOs in our sample are small- to medium-sized companies. The mean gearing ratio (*GEAR*) is 1.633 and median ratio is 0.803.

Insert Table 4.3 about here

4.4 Post-SMBO performance

Table 4.4 presents median abnormal performance measures for full sample, up to five post-SMBO years (Y1-5). Abnormal performance (AP_{it}) estimated as:

$$AP_{it}=P_{it}- E(P_{it}) \qquad \textit{(Equation 1)}$$

Where, P_{it} is the actual performance ratio during the post-event period and $E(P_{it})$ is the expected performance of the SMBO during the post-event period. $E(P_{it})$ is estimated by P_{it-1} or $P_{it-1} + \Delta PI_{it}$. P_{it-1} is the median value of performance three years before an SMBO. ΔPI_{it} is difference between the industry control group's performance in period t and the industry's median pre-SMBO performance.

In terms of unadjusted abnormal performance, we observe a significant decrease in profitability (measured by *ROA*) and growth after the transaction.[78] When we adjust for industry performance, SMBOs underperform in productivity, while the results for other performance measures are similar to those from the 'level' model.[79] The results indicate that industry wide factors are not the main reason for SMBO underperformance, except for productivity. The results show a decreasing trend in growth performance measures. Overall,

[77] It should be noted that *LNSIZE* and variables of *Previous performance* are time invariant, therefore Ns of these variables are the numbers of SMBOs. But, Crisis and GEAR are time variant, so Ns for *Crisis* and *GEAR* are the numbers of firm-year observations over five years.
[78] Measured by *ROS* the profitability improves only in the first year.
[79] $E(P_{it})$ is estimated as P_{it-1}.

SMBOs underperform.

Insert Table 4.4 about here

4.5 The determinants of post-SMBO performance

4.5.1 Selling and buying PE funds

We adopt multivariate GLS random-effects panel regression as our main method as previous chapters.[80] In order to correct for the heteroskedasticity of standard errors, z-statistics are based on robust standard errors.

$$AP_{it}=\alpha+\beta_1 Buying\ late_i+\beta_2 Dry\ powder_i+\beta_3 Buying\ late_i * Dry\ powder+\gamma_1 X_{it}+\varepsilon_{it}$$

(Equation 2)

The dependent variables (AP_{it}) are abnormal performance ratios for profitability (*AROA, AROS*), productivity (*ASALEMP*), employment growth (*AEMPG*), and sales growth (*ASALG*). Equation (2) examines Hypothesis 1a and 1b. We create a dummy variable of *Buying late* which takes the value of 1 if the buying fund is older than 4 years in the transaction year.[81] We create an interaction term, *Buying late * Dry powder* to capture the interactive effect of these two variables.

X_{it} represents a set of control variables. First, in addition to the control variables used in previous chapters, we include a dummy variable to indicate whether the SMBOs were PE-backed in the primary stage or not (*Primary PE-backed).* Primary PE-backed SMBOs might perform worse than others, because primary PE firms have already adopted value creation mechanisms to alleviate the agency problem. Second, we use a dummy to indicate whether the SMBO is backed by more than one PE firms or not (*Club deals).*

[80] We run the OLS regression model, the F tests show that OLS is not suitable for our data. Also the Breusch and Pagan test and the Hausman test suggest the random effect model instead of the pooled OLS and the fixed effect model.

[81] We choose 4 year as cut-off because first, the investment period of PE funding usually is 4-6 years (Arot et al., 2014). Second, the average buying fund age is 4.3 years in our sample.

Previous studies suggest that syndication will have a positive impact on a target companies' performance. Third, we controlled for investment round by using a dummy (*Multiple investments*). In order to control for investment risk, PE firms might divide their capital into several investment rounds. Once the target companies achieve the target, they will invest further capital. Thus, multiple investments might have positive impact on the target companies' performance. Fourth, we also include a dummy to indicate whether the PE firm is independent from banks or insurance companies (*Selling/Buying PE independent*), as independent PE firms are under more pressure to achieve higher return requirements, and therefore, might enhance the performance of target companies more efficiently compared with others. In addition, we adopt a dummy variable (*Management Participation*) of management participation in ownership to proxy for management incentive. We also use the logarithm of total assets (in £thousand) one year before the transaction as a proxy for size (*LNSIZE*). Our results from the Pearson correlations (Appendix 4.2) do not show a significantly high correlation between our explanatory variables. Industry dummies and entry year dummies are also included.

Insert Table 4.6 about here

Table 4.6 shows the results of equation (2). Panel A uses unadjusted abnormal performances and Panel B uses industry adjusted abnormal performance. In Panel A, the results demonstrate that buying late has a negative and statistically significant relationship with unadjusted abnormal performance in employment growth (coefficient: -0.420, z-stat: -2.190) and sales growth (coefficient: -0.604, z-stat: -1.990). This implies that when the buying funds are older than 4 years or come to the end of their investments period, SMBOs tend to underperform in employment growth and sales growth (H1a). The results also show that dry powder significantly and negatively impacts on unadjusted abnormal performance

in employment growth (coefficient: -0.036, z-stat: -1.734). Out of the two individual variables, the interaction variable of *Buying late* Dry powder* has a positive and significant relationship with the unadjusted abnormal performance in employment growth (coefficient: 0.109, z-stat: 2.455) and sales growth (coefficient: 0.166, z-stat: 2.248). When a buying PE fund is close to the end of its investment period, dry powder increased by one point will lead to 7.3% and 7.1% increases in unadjusted abnormal performance in employment growth and sales growth, respectively. These results are inconsistent with our hypothesis 1b. However, these results are not robust to the industry adjusted abnormal performance measures.

Our regression results show that the financial crisis and gearing are negatively associated with post-SMBO performance. Our results demonstrate that companies with better pre-SMBO performance tend to perform worse in the post-SMBO period. We also find some evidence that syndication and management participation in ownership can help increase the performance of target companies.

$$AP_{it}=\alpha+\beta_1 Selling\ late_i+\beta_2 Primary\ duration_i+\beta_3 Selling\ late_i*Primary\ duration_i+\gamma_1 X_{it}+\varepsilon_{it}$$

(Equation 3)

Equation (3) tests the Hypotheses 1c. As with equation (2), we constructed a dummy variable (*Selling late*) that equals 1 if the selling PE fund age is greater than 8 years when it exits the target company, 0 otherwise.[82] The primary duration (*Primary duration*) is included to investigate the influence of the primary holding period on the relationship between selling late and post-SMBO performance. The interaction variable (*Selling late* Primary duration*) of selling late and primary duration captures this influence. When the selling funds come to the end of the fund's life, SMBOs could be forced to exit earlier and

[82] The fund life is 10 years on average. The average selling fund age of our sample is about 9 years. Exiting in year 9 or longer in the fund life should be late.

leave performance improvement room for the next round. X_{it} represents a set of control variables. Industry dummies and entry year dummies are included.

Insert Table 4.7 about here

The results are reported in Table 4.7. We find that the coefficient on selling late is positive and significant at the 5% level in panel A (coefficient: 0.372, z-stat: 2.294) and panel B (coefficient: 0.411, z-stat: 2.199), when the dependent variable is unadjusted and industry adjusted abnormal performance in profitability (measured as *ROA*), respectively. The positive sign implies that when the selling PE fund is older than 8 years (which means close to the end of the fund life) SMBO tends to perform better in profitability (measured as ROA) than other SMBOs (H1c). The coefficient for the interaction term (*Selling late *Primary duration*) is negative and statistically significant in the model for *ROA* in both panel A (coefficient: -0.093, z-stat: -2.273) and panel B (coefficient: -0.099, z-stat: -2.057). When the selling PE fund is close to the end of the fund life, even if the primary holding period is long, the SMBOs still underperform in profitability (measured as *ROA*). In regressions for other performance measures, the coefficients for the interaction variable are no longer statistically significant.[83] Thus, we conclude that there is evidence that selling pressure has an impact on post-SMBO performance, but that this impact only appears in profitability measured by *ROA*.

4.5.2 The impact of PE Firms

On average, selling PE firms tend to be more experienced than buying PE firms. There are also more PE firms specializing in the buyout/acquisition stage. These findings are consistent with those reported by Jenkinson and Sousa (2013, 2014), suggesting that

[83] In panel regression, the model with *ASALEMP* does not include entry year dummy, because if we include both dummies, the Wald chi2 is missing by STATA. But including or excluding entry year dummy do not change the results.

selling PE firms tend to be older and more experienced (using different proxies), compared to buying PE firms.[84] In this section, we study whether the heterogeneity of PE firms could explain post-SMBO performance. We use the following panel regression model:

$$AP_{it} = \alpha + \beta_1 Buying\ industry\ experience_i + \beta_2 Buying\ investments/\ executives_i + Buying\ stage\ specialization_i + \beta_4 Primary\ PE\ backed_i + \beta_5 Club\ deals_i + \beta_6 Buying\ PE\ independent_i + \beta_7 LNSIZE_i + \beta_8 Secondary\ duration_i + \beta_9 Crisis_{it} + \beta_{10} Management\ participation_i + \beta_{11} GEAR_{it} + \beta_{12} Previous\ performance_i + \varepsilon_{it}$$

(Equation 4)

Where, *Buying industry experience*, *Buying investments/ executives*, and *Buying stage specialization* are examined variables. The other variables on the right hand side are control variables which are defined in Table 4.5. Equation (4) includes all target companies that are backed by PE firms in secondary stage. The regression specialization includes entry year dummies and PE industry dummies.

Insert Table 4.8 about here

Table 4.8 presents the panel regression results for the influence of buying PE firms characteristics on post-SMBO abnormal performance. Once again, Panel A uses unadjusted abnormal performances as dependent variables while Panel B uses industry adjusted abnormal performance. In Panel A, the results clearly indicate that the industry experience of buying PE firms has a significant and positive impact on the post-SMBO abnormal performance in growth, measured by employment growth (coefficient: 0.042; z-stat: 2.418) and sales growth (coefficient: 0.036; z-stat: 1.752). To be specific, a one point increase in the buying PE firm's industry experience will lead to 4.2% and 3.6% increases in post-SMBO changes in employment growth and sales growth respectively. These findings are

[84] Jenkinson and Sousa (2013) studied with 194 European SMBOs (108 UK SMBOs) from 2000 to 2007. Jenkinson and Sousa (2014) studied 759 European SMBOs (165 UK SMBOs) from 2000 to 2007.

consistent with H2. Moreover, our results show buyout stage specialization has a significantly negative relationship with the change in employment growth (coefficient: -0.091; z-stat: -1.680). Meanwhile, although the results are insignificant, stage specialization negatively impacts on post-SMBO abnormal performance in profitability, productivity, and sales growth. This finding contradicts H2 and those of Cressy et al. (2007) in which buyout stage significantly and positively relates to post-buyout productivity. In Panel B, none of the coefficients associated with the buying PE firm's characteristics is significant in explaining industry adjusted abnormal performance. The only exception is the coefficient for industry experience in the *AROA* model (coefficient: 0.018; z-stat: 2.477).

Overall, our results show weak evidence that buying PE firms' characteristics impact on the post-SMBO performance (H2). Our findings imply that buying PE firms tend to invest in SMBOs with good potential for growth.

4.6 Robustness checks and further analysis

4.6.1 Post-SMBO performance and the differences in characteristics between selling and buying PE firms

We argue that post-SMBO performance could be determined by differences between selling and buying PE firms. Now, we look at whether changes in PE firm's characteristics can explain post-SMBO performance. We do so by employing the random-effects panel regression, using the subsample of SMBOs that are PE-backed in both the primary and secondary phases. The differences in PE firm's characteristics (*Different industry experience* and *Different investments/ executives*) are measured as variables of buying PE firm characteristics (*Buying industry experience* and *Buying investments/ executives*) minus the counterpart variables of selling PE firm characteristics. More industry experience and fewer investments per executive of buying PE firms, compared to selling PE firms, may

bring more resources and opportunities to improve performance. *Different stage specialization* is a dummy variable that takes value of 1 if the buying PE firm is buyout stage specialization and the selling PE firm is not, and 0 otherwise. If the selling PE firm is not buyout stage specialized, more value creation potential may be left for secondary round investors. Thus, buyout specialized buying PE firms may generate better post-SMBO performance. We regress the unadjusted and industry adjusted post-SMBO abnormal performance on the three explanatory variables and a set of control variables as equation (4).

In Panel A of Table 4.9, we do not find evidence that differences in industry experience and the number of investments per executive have a significant relationship with post-SMBO performance. These results are inconsistent with our H2. However, when we use industry adjusted post-SMBO abnormal performance as dependent variables (Panel B), we observe that *Different industry experience* and *Different investments/executive* have significantly positive and negative relationships with post-SMBO abnormal performance in employment growth, respectively. These results indicate that after controlling for industry factor, more industry experience and fewer investments per executive of buying PE firms, compared to selling PE firms, can improve employment growth. Interestingly, we find a significant and negative relationship between *Different stage specialization* and post-SMBO abnormal performance in productivity (unadjusted coefficient: -0.094) and sales growth (unadjusted coefficient: -0.222; industry adjusted coefficient: -0.141). When backing PE firms change from non-buyout specialized to buyout specialized, unadjusted abnormal performance in productivity and sales growth will be 9.4% and 22.2% (industry adjusted: 14.1%) lower than those of other SMBOs, respectively.

Insert Table 4.9 about here

4.6.2 Alternative measure of dry powder

We demonstrate dry powder alleviates the negative relationship between buying late and post-SMBO performance. This finding is inconsistent with the expectation that the greater dry powder a PE fund has, the more likely it is that a buying late PE fund will invest in bad SMBOs. In order to check this finding's sensitivity, we created a dummy variable (*Dry powder dummy*) and reran equation 2. We randomly chose a 25% cut-off point. *Dry powder dummy* equals to 1 if the uninvested fund is more than 25% of committed capital and 0 otherwise. The results in Panel A of Table 4.10 are similar to those in Panel A of Table 4.6. Notably, when we use industry adjusted abnormal performance measures, we still observe that *Buying late* is negatively and significantly (coefficient: -0.320, z-stat: -2.467) and the interaction term is positive and significant (coefficient: 0.355, z-stat: 2.614), related to employment growth (*AEMPG*), consistent with our main results. The results indicate that buying late pressure will cause buying PE firms to choose bad deals while huge dry powder can alleviate this negative relationship.

Insert Table 4.10 about here

4.6.3 Post-SMBO performance and buying PE firms' characteristics (excluding unspecified fund data)

When a PE fund has unlimited life span (green fund), PE firms will not have pressure to invest or obtain high returns, because the fund investors might be their parent companies such as banks. In these cases, PE firms might have a weak influence on target companies' performance. These cases may affect our results (Table 4.8). Hence, we restricted our sample to SMBOs invested by PE funds with a limited fund life and reran the equation 4.

The results are showed in Table 4.11. With regard to Panel A, similar to the results

in Table 4.8, the impact of PE firms mainly focuses on growth performance. Different from the results in Table 4.8, we find the coefficients on industry experience in *AEMPG* and *ASALG* models are significant and higher (0.061 and 0.052, respectively). Furthermore, the absolute values of coefficients on *Buying stage specialization* in models for *AEMPG* and *ASALG* are significant and higher (0.125 and 0.198, respectively) than those of Table 4.8. In addition, we find the more investments per executive, the less the abnormal performance in growth (measured by *AEMPG*). When we use industry adjusted abnormal performance as dependent variables (Panel B), the results still shows that industry experience and fewer investments per executive improve growth performance while buyout stage specialization reduces the growth performance. In sum, when buying funds have a limited life span, buying PE firms seem to take more effort to improve targets' performance, especially growth performance, consistent with H2. On the other hand, the buyout stage specialization deteriorates the growth performance after SMBO transactions, suggesting that buyout stage specialization is not suitable to secondary round buyouts.

Insert Table 4.11 about here

4.6.4 Potential sample selection bias

A potential concern is whether our sample leads to a possible sample selection bias of PE backing. Post-SMBO performance may be driven by the buying PE firm's ability to identify better companies to invest in rather than the impact of the characteristics of PE firms or the longevity of PE fund. Thus, we correct sample selection bias for equation 2, 3, and 4, by using the Heckman two-step model.

$$PE_i=\alpha+\beta_1 BSERVICES_i+\beta_2 LNSIZE_i+\beta_3 ROAt\text{-}1_i+\varepsilon_i \qquad \textit{(Equation 5)}$$

Equation 5 is Probit regression with a robust variance estimate for the probability of receiving PE backing. As in previous chapters, we hypothesize that the choice of a PE

firm's investment in a SMBO is associated with company size (*LNSIZE*), pre-SMBO performance (*ROAt-1*), and primary buyout's industry (*BSERVICES*). [85] *Lambda* is the estimated probability of a PE firm's investment in an SMBO. In the second step, we include *Lambda* as an additional explanatory variable into equations 2, 3, and 4. The results are presented in Table 4.12[86]. The results of Probit regression (Panel A) are qualitatively similar to those in previous chapters. *Lambda* is not statistically significant in all the models, except for the models for *AROS* and *ASALEMP* in Panel B and the model for *AROA* in Panel C. However, the coefficients for our main explanatory variables are qualitatively similar to our main results. Hence, the potential sample selection biases do not affect our main results.

Insert Table 4.12 about here

4.6.5 Selling late and buying early

In section 4.5, we find that selling late SMBOs have better post-SMBO profitability performance. We also find that buying late SMBOs perform worse in terms of unadjusted growth performance, indicating that buying early SMBOs might perform better. These findings show that selling late and buying early SMBOs might have performance improvement potential that might be achieved easily by using traditional performance improvement mechanisms. In other words, the impact of buying PE firms' characteristics (competitive advantages) on post-SMBO performance will be weakened.

In order to support this argument, we included two dummy variables (*Selling late* and *Buying early*) into equation 4, separately. [87] We create interactive terms of the two dummies with *Buying industry experience*, *Buying investments/ executive*, and *Buying stage*

[85] We use total assets instead of deal value as the proxy for size.
[86] We use industry adjusted performance measures to test the potential sample selection bias (Appendix 4.3). The results are statistically similar to those of the models of industry adjusted measures without Lambda, though Lambda is significant in some models in Panel A and B.
[87] *Buying early* is equal to 1 if buying fund age is less than 4 years and 0 otherwise.

specialization. The results are presented in Table 4.13. Panel A includes *Selling late* while Panel B includes *Buying early*. In Panel A, the interaction term of *Buying industry experience* and *Selling late* is significantly negative in models with dependent variables of *AROA*, *ASALEMP,* and *AEMPG* (coefficient:-0.033, -0.099, and -0.064, respectively). These results imply that selling late SMBOs are associated with the weaker influence of industry experience on post-SMBO performance in terms of profitability, productivity, and growth. Furthermore, *Buying investments/executive*Selling late* is significantly and positively related to post-SMBO performance in *AROS* (coefficient: 0.057), suggesting that selling late reduces the effort of executive with fewer investments. In Panel B, the results show that *Buying industry experience*Buying early* is significantly and negatively related to *ASALEMP* (coefficient: -0.197). *Buying investments/ executive*Buying early* is significantly and positively related to *ASALEMP* (coefficient=0.062). These results imply that buying early will weaken the impact of industry experience and investments/executive on post-SMBO performance in productivity. However, we find that the coefficient for *Buying stage specialization *Buying early* in the model for *ASALEMP* is significantly positive (coefficient: 0.337).

To sum up, compared to buying early, selling late is more likely to weaken the influence of previous industry experience and investments per executive on post-SMBO performance[88]. When SMBOs have performance improvement potential left by previous PE firms, buying PE firms seem not to take the same effort as others to improve performance, for instance, using their previous industry experience or executive spending more time and

[88] We also use industry adjusted abnormal performance measures (Appendix 4.4). Although the results change in some models, they still show some evidence that *Selling late* and *Buying early* can mitigate the impact of industry experience and investments/executive on post-SMBO performance. Furthermore, the industry factor blurs the disparity between buying early and selling late subsamples.

energy. These results are consistent to our main results to some extent.[89]

Insert Table 4.13 about here

4.7 Conclusion

We extend our data by collecting the information of PE firms and funds. The final sample consists of 227 SMBOs, with 192 backed by PE firms in the primary phase and 204 backed by PE firms in the secondary phase. The univariate analysis for post-SMBO abnormal performance indicates that SMBOs underperform in terms of profitability, productivity, and growth. These results are consistent with those in previous chapters. We also find significant differences between selling and buying PE firms and funds. For instance, buying PE firms, on average, have fewer investments per executive and are less likely to be specialized in the buyout stage, compared to selling PE firms. Furthermore, buying PE funds are younger than selling PE firms.

When we use unadjusted abnormal performance as dependent variables, significantly negative coefficients are observed for buying late in models with growth ratios. The results support our H1a. The interaction term of buying late and dry powder is significant positive

[89] By contrast, companies in selling early and buying late subsamples are more likely to be bad. In their early periods of fund life, selling funds are not under pressure to exit their portfolio companies. Instead of exiting via SMBOs, they prefer IPOs or trade sales as exit routes for good companies as these two exit routes will bring more investment returns and a better track record. Hence, in the absence of selling pressure, SMBOs tend to be the last resort for bad companies. With regard to buying late SMBOs, the buying funds are approaching the end of their investment periods, which force them to invest the untapped capital. Under this pressure, they tend to 'go for broke' by choosing the easy access investments and spending less effort on due diligence. As a consequence, these buying funds are more likely to invest in bad companies. In contrast to good companies, for bad companies, the comparative advantages offered by buying PE firms may have a stronger effect on their performance.

Our results in terms of selling early (please see Panel A of Appendix 4.5) show evidence that coefficients on the interaction term of *Selling early* and *Buying industry experience* are significantly positive, suggesting that the industry experience of buying PE firms from selling late subsample has stronger influence on abnormal performance than others. We also find that the coefficient on the interaction term of *Selling early* and *Buying investments/executive* in model of AROS is significantly negative, indicating that fewer investments per executive has stronger influence on abnormal performance than others. Likewise, in Panel B of Appendix 4.5, our results show that *Buying industry experience* and *Buying investments/executive* of buying PE firms from buying late subsample have stronger influences on ASALEMP than their counterparts. The results are opposite to those of selling late and buying early subsamples. This implies that performance improvement in bad companies in selling early and buying late subsamples rely more on the competitive advantages of buying PE firms than those of good companies in selling late and buying early subsamples.

associated with abnormal performance in growth. The result contradicts our H1b. Nevertheless, when we use industry adjusted abnormal performance as dependent variables, none of the above coefficients are statistically significant. Our results lend only weak evidence to hypothesis 1c. The empirical analysis hereto does not provide strong support for our hypotheses in terms of funds' selling and buying pressure. This contradicts the results of recent working papers (Arcot et al., 2014 and Degeorge et al., 2013) that use financial multiples to measure performance. One explanation could be that selling and buying pressure have an impact on the bargaining power of PE firms while not on the operating performance of target companies.

We then examined the relationship between the characteristics of PE firms and post-SMBO performance. Following previous studies on the heterogeneity of PE firms, we choose industry experience, investments per executive, and buyout/acquisition stage specialization as proxies for the differences of characteristics (competitive advantages) of PE firms. Our results show that the industry experience of buying PE firms only improve unadjusted performance in employment growth and sales growth (H2).

To check the robustness of our results, we considered different measures, subsamples, and methods. We first examined the impact of differences of characteristics between selling and buying PE firms of the same target companies on post-SMBO abnormal performance. Compared to selling PE firms, more industry experience and fewer investments per executive of buying PE firms were not found to result in better post-SMBO abnormal performance. Nevertheless, the buyout/acquisition stage specialization of buying PE firms deteriorates post-SMBO performance. We then used an alternative measure of dry powder and reran the regressions. The results are consistent with our main results. Thirdly, we restricted our sample to SMBOs invested by PE funds with limited fund life and reran the

relevant regressions on PE firms' characteristics. The results are inconsistent with our main results. In fact, when PE firms encounter limited life, the buying PE firms tend to enhance the performance. The characteristics of buying PE firms, hence, show a significant relationship with post-SMBO abnormal performance in growth. Similarly, the buyout/acquisition stage specialization has a significantly negative relationship with growth, indicating again that buyout/acquisition stage specialization does not help SMBOs. Fourthly, we tested the potential sample selection bias by using the Heckman two-stage model. Although selection biases exist in our sample, the results are qualitatively similar to our main results. Finally, we investigated whether selling late and buying early have an impact on the relationship between the characteristics of buying PE firms and post-SMBO performance. Our results show that selling late is more likely to mitigate the effect of the characteristics of buying PE firms on post-SMBO performance.

There are some limitations to our study. First, due to the limitation of our database access, we employed the simplest way to calculate dry powder. Although there is no uniform definition of dry powder, our calculation method may cause some bias, as PE firms always vary in their tolerance of unspent committed capital. This might provide another explanation of the result that dry powder alleviates the negative relationship between buying late and post-SMBO growth performance. Second, due to the same database-related reason, we cannot employ other proxies for industry experience and buyout/acquisition stage specialization that control for PE industry factor.[90]

[90] Many studies also use the Herfindhal index to evaluate industry specialization (e.g. Cressy et al., 2007). We could not obtain this kind of data either.

Table 4.1: Sample distribution

This table reports sample distribution. Panel A shows the list of observable selling and buying lead PE firms. N is the number of SMBOs in which these PE firms were involved either as sellers or buyers. 'Unknown' means the SMBO is PE-backed but we could not obtain the names of PE firms. Panel B presents the sample distribution in terms of buyout types. Panel C presents selling and buying funds' distribution by vintage years.

Panel A: List of selling and buying lead PE firms and number of involved SMBOs

Selling lead PE firm	N	Buying lead PE firm	N
3i	41	Bank Of Scotland Corporate	14
Bridgepoint	15	LDC	9
LDC	13	3i	7
ECI Partners LLP	8	ISIS Equity Partners	7
Barclays Private Equity	7	Phoenix Equity	7
CBPE Capital LLP	5	Bridgepoint	
HSBC Private Equity	5	Hg Capital	6
Royal Bank Private Equity	5	Barclays Private Equity	5
Aberdeen Asset Managers Growth	4	AAC Capital Partner	5
Bank Of Scotland Corporate	4	NVM Private Equity	5
Dunedin Capital	4	Graphite Capital	5
Graphite Capital	4	HSBC Private Equity	5
Gresham Trust	4	ABN AMRO Private Equity	4
Permira Advisers LLP	4	August Equity LLP	4
Cinven	3	Dubai International Capital	4
Electra Partners LLP	3	Dunedin Capital	4
Irrfc	3	Matrix Private Equity Partners	4
LGV Capital	3	Change Capital Partners LLC	3
Lyceum Capital	3	Beringea	3
NBGI Private Equity Ltd	3	CBPE Capital LLP	3
Royal Bank Development Capital	3	Candover	3
Alchemy Partners	2	Charterhouse Capital	3
August Equity LLP	2	GCP Member Ltd	3
Barclays Ventures Ltd	2	Gresham Llp	3
CVC Capital Partners Ltd	2	LGV	3
Duke street	2	Vision Capital	3
YFM Equity	2	Aberdeen Asset Managers Growth	2
ABN AMRO Private Equity	1	Advent International	2
Acus Management Partners Ltd	1	Barclays Ventures	2
Advantage Capital	1	Blackstone Group LP	2
Advent International Corp	1	Endless LLP	2
Apax Partners	1	Electra Partners LLP	2
BC Partners	1	Exponent Private Equity LLP	2
Bain Capital LLC	1	GE Capital Finance	2
Boston overseas equity	1	HarbourVest Partners LLC	2
Candover	1	Lion Capital	2
Carlyle Group	1	NBGI Private Equity Ltd	2
Charterhouse	1	Spirit Capital Partners LLP	2
Clayton Dubilier & Rice LLC	1	TA Associates	2
Elderstreet Investments Ltd	1	Arion banki hf.	1
Exponent Private Equity LLP	1	ECI Partners	1
GCP Member Ltd	1	RJD Partners	1
Hermes Gpe Llp	1	Albany Venture Managers Ltd	1
Hg Capital	1	Altor Equity Partners AB	1
ISIS Equity Partners PLC	1	American Capital Ltd	1
Inflexion PLC	1	Arle Capital LLP	1
Intermediate Capital	1	BC Partners	1
J.F. Lehman & Company	1	Bain Capital Inc	1
JPMorgan Chase & Co	1	Baird Capital	1
Jordan Co LLC	1	Boundary Capital	1

(Continued)			
Klesch Capital Partners	1	Bridges Community Ventures Ltd	1
Lion Capital LLP	1	Carlyle Group	1
Matrix Private Equity Partners	1	Cognetas	1
Mezzanine Management Finanz und Unterneh	1	Dawnay Day Principal Investments	1
Milestone Capital Partners LLP	1	Derwent London PLC	1
Nomura International PLC	1	Duke Street	1
PHOENIX EQUITY	1	EM Warburg Pincus & Co Inc	1
Parkmead Group PLC	1	Enterprise Finance Europe	1
Rollins Specialty Group, Inc.	1	Elderstreet Investments	1
Silverfleet Capital LLP	1	European Capital Ventures PLC	1
Sovereign Capital Ltd	1	Henderson Private Equity	1
TA Associates	1	Hermes Gpe Llp	1
Welsh Carson Anderson & Stowe	1	Hotbed	1
		Hutton Collins Partners	1
		Intermediate Capital Group PLC	1
		Investcorp Bank BSC	1
		ISB CAPITAL INVESTMENTS	1
		Kelso Place Asset Management LLP	1
		Langholm Capital LLP	1
		Lyceum Capital	1
		Oak Hill Capital Partners	1
		Och-Ziff Capital Management	1
		Octopus Ventures Ltd	1
		PAI Partners	1
		Pi Capital	1
		Rhone Capital	1
		Royal Bank Development Capital	1
		Royal London Private Equity Ltd	1
		Rutland Partners LLP	2
		Saints Chamonix	1
		SCF Partners LP	1
		Shackleton Ventures	1
Number of PE firms	63	Number of PE firms	82
Number of SMBOs	192	Number of SMBOs	198
Unknown of selling PE firms	0	Unknown of buying PE firms	6
Total number of PE-backed primary buyouts	192	Total number of PE-backed SMBOs	204
As % of sample SMBOs	84.6	As % of sample SMBOs	89.9

Panel B: Sample distribution in terms of buyout types[91]

Buyout type	No. of SMBOs	As % of sample
BIMBO	9	3.96
IBO	62	27.31
MBI	12	5.29
MBO	144	63.44
Total	227	100

[91] BIMBO is a combination of buy-in and a buy-out; IBO is a buyout in which PE firms are only investors; MBI is a management buy-in buyout; MBO is a management-led buyout.

Panel C: Fund distribution by vintage year

Selling PE fund				Buying PE fund			
Vintage year	Freq.	Percent	Cum.	Vintage year	Freq.	Percent	Cum.
1975	2	1.32	1.32				
1982	7	4.64	5.96				
1986	1	0.66	6.62	1986	1	0.68	0.68
1987	4	2.65	9.27	1987	0	0	0.68
1988	2	1.32	10.6	1988	0	0	0.68
1989	5	3.31	13.91	1989	3	2.05	2.74
1990	4	2.65	16.56	1990	0	0	2.74
1991	1	0.66	17.22	1991	1	0.68	3.42
1992	3	1.99	19.21	1992	1	0.68	4.11
1993	6	3.97	23.18	1993	1	0.68	4.79
1994	11	7.28	30.46	1994	2	1.37	6.16
1995	0	0	30.46	1995	0	0	6.16
1996	25	16.56	47.02	1996	1	0.68	6.85
1997	21	13.91	60.93	1997	0	0	6.85
1998	15	9.93	70.86	1998	8	5.48	12.33
1999	5	3.31	74.17	1999	7	4.79	17.12
2000	19	12.58	86.75	2000	23	15.75	32.88
2001	9	5.96	92.72	2001	24	16.44	49.32
2002	4	2.65	95.36	2002	13	8.9	58.22
2003	4	2.65	98.01	2003	19	13.01	71.23
2004	2	1.32	99.34	2004	10	6.85	78.08
2005	1	0.66	100	2005	18	12.33	90.41
				2006	8	5.48	95.89
				2007	6	4.11	100
Total	151	100		Total	146	100	

Table 4.2: PE firms and funds - summary statistics

This table shows the results of the summary statistics of the variables. Panel A presents the summary statistics of characteristics of the selling and buying PE firms and funds. Panel B and Panel C contain comparison results of characteristics of selling and buying PE firms and funds. Values in columns of selling side and buying side are mean values in Panel B and median values in Panel C which are the same as those in Panel A. Difference is calculated as the mean value (median values) of the selling side minus that of the buying side. For the analysis, we used logarithms of industry experience and dry powder. P-values are results of unpaired unequal t test for Panel B and Wilcoxon signed-rank test for Panel C. N is the number of SMBOs. Definitions of all variables are presented in Table 4.5.

Panel A: Characteristics of selling and buying PE firms and funds

		N	Mean	S.D.	P25	Median	P75
Selling side	Industry experience	191	23.670	40.053	3	9	26
	Investments/executive	187	5.739	8.965	2.047	4.057	7.667
	Stage specialization	186	0.948	0.388	1	1	1
	Fund age	187	9.027	5.254	6	8	11
	PE independent	191	0.675	0.469	0	1	1
Buying side	Industry experience	191	18.414	29.199	2	10	21
	Investments/executive	186	3.643	2.446	1.633	2.861	5.043
	Stage specialization	187	0.884	0.358	1	1	1
	Fund age	186	4.301	4.436	1	3	6
	PE independent	191	0.681	0.467	0	1	1
	Dry powder	182	68.100	29.957	46.4	73.55	100

Table B: Comparison of characteristics of selling and buying PE firms and funds (mean value)

	Selling side	Buying side	Difference	P-value
Industry experience	23.670	18.414	5.256	0.143
Investments/executive	5.739	3.643	2.096	0.002
Stage specialization	0.948	0.884	0.064	0.023
Fund age	9.027	4.301	4.726	0.000
PE independent	0.675	0.681	-0.006	0.913

Table C: Comparison of characteristics of selling and buying PE firms and funds (median value)

	Selling side	Buying side	Difference	P-value
Industry experience	9	10	-1	0.372
Investments/executive	4.057	2.861	1.196	0.000
Stage specialization	1	1	0	0.000
Fund age	8	3	5	0.000
PE independent	1	1	0	0.813

Table 4.3 Deal characteristics

This table shows the summary statistics of deal characteristics of the sample SMBOs. Panel A is the deal characteristics at primary and secondary buyout stages, respectively. Panel B exhibits the characteristics of target companies. N is the number of SMBOs. But, N for *Crisis* and *GEAR* is firm-year observations. The definitions of all variables are presented in Table 4.5.

Panel A: Primary and secondary stages

		N	Mean	S.D.	P25	Median	P75
Primary stage	Primary Duration	215	60.870	32.944	38	54	77
	Primary PE-backed	227	0.846	0.362	1	1	1
Secondary stage	Secondary Duration	227	51.784	21.419	38	50	63
	Secondary PE-backed	227	0.899	0.302	1	1	1
	Investment round	197	0.223	0.418	0	0	0
	Club PE	200	0.160	0.368	0	0	0
	Management participation	227	0.727	0.447	0	1	1

Panel B: Target company's characteristics

	N	Mean	S.D.	P25	Median	P75
ROAt-1	214	0.130	0.120	0.063	0.118	0.186
ROSt-1	203	0.077	0.175	0.045	0.090	0.144
SALEMPt-1	195	2.096	0.352	1.879	2.063	2.238
EMPGt-1	179	0.057	0.257	-0.010	0.055	0.139
SALGt-1	182	0.134	0.338	0.013	0.112	0.228
Crisis	1135	0.629	0.483	0	1	1
LNSIZE	227	4.335	0.568	3.983	4.293	4.675
GEAR	576	1.633	2.069	0.255	0.803	2.297

Table 4.4: Summary results for the post-SMBO performance

This table presents median abnormal performance measures for the full sample, up to five post-SMBO years (Y 1-5). Abnormal performance (AP_{it}) is calculated as: $AP_{it} = P_{it} - E(P_{it})$. where, P_{it} is the actual performance in year t after SMBO transactions while $E(P_{it})$ is the expected performance of the target company in year t after SMBO transactions. It is estimated by two models: $E(P_{it}) = P_{i,t-k}$, and $E(P_{it}) = P_{i,t-k} + \Delta PI_{it}$; where, the former is 'level' model using unadjusted benchmark and the latter is 'change' model using industry adjusted benchmark. All results are based on 99% winsorized data. We employed the Wilcoxon signed rank test (median=0, vs. median≠0) to test the significance of the abnormal performance. ***, **, *, indicate significance of the test at the 1, 5, and 10 percent levels respectively. The total number of observations and number of observations with positive values are reported in brackets. Definitions of abnormal performance measures are presented in Appendix 2.1.

		Y1	Y2	Y3	Y4	Y5
Profitability	Benchmarks					
AROA	$E(P_{it}) = P_{it-1}$	-0.007	-0.025***	-0.037***	-0.036***	-0.061***
		(193: 92)	(170:66)	(124:42)	(77:27)	(38:11)
	$E(P_{it}) = P_{it-1} + \Delta PI_{it}$	-0.005	-0.037***	-0.048***	-0.078***	-0.072**
		(184:89)	(166:64)	(120:39)	(72:17)	(34:12)
AROS	$E(P_{it}) = P_{it-1}$	0.017**	0.003	-0.003	0.000	-0.021
		(155:90)	(138:70)	(102:48)	(56:28)	(32:11)
	$E(P_{it}) = P_{it-1} + \Delta PI_{it}$	0.011	-0.001	-0.011*	-0.003	-0.026
		(148:84)	(133:65)	(98:42)	(51:25)	(27:10)
Productivity						
ASALEMP	$E(P_{it}) = P_{it-1}$	0.047***	0.034***	0.030***	0.025	-0.023
		(153:111)	(132:86)	(94:57)	(58:39)	(27:11)
	$E(P_{it}) = P_{it-1} + \Delta PI_{it}$	-0.018	-0.029**	-0.055***	-0.039	-0.126*
		(135:59)	(113:42)	(83:27)	(43:18)	(14:3)
Growth						
AEMG	$E(P_{it}) = P_{it-1}$	-0.004	-0.022**	-0.057***	-0.038	-0.033
		(152:75)	(133:52)	(101:31)	(53:18)	(26:10)
	$E(P_{it}) = P_{it-1} + \Delta PI_{it}$	-0.016	-0.036**	-0.063***	-0.056*	-0.006
		(127:58)	(111:43)	(83:21)	(41:16)	(17:8)
ASALG	$E(P_{it}) = P_{it-1}$	-0.005	-0.050***	-0.071***	-0.107**	-0.201***
		(139:69)	(123:50)	(91:33)	(42:13)	(20:2)
	$E(P_{it}) = P_{it-1} + \Delta PI_{it}$	0.010	-0.010	-0.046*	-0.063	-0.122**
		(135:69)	(121:58)	(89:37)	(42:18)	(20:6)

Table 4.5: Definitions of variables

This table presents the definitions of all variables used in our regressions, excluding the performance measures which are the same as in previous chapters.

PE Firm characteristics:

Industry experience: following Clercq and Dimov (2008), we measured the PE experience for each SMBO by counting the number of initial investments (investee companies) made by the lead PE firms in the same industry as the target company prior to the transaction year. For the regression, we will use the logarithm of *Industry experience*.

Investments/executive: the total number of investments managed by a lead PE firm divided by the number of investment executives employed by the PE firm up to 2013.

Stage specialization: according to Cressy et al. (2007), we calculated the percentage of investments (number of companies) of lead PE firms up to 2013 in 6 stage types: seed, early-stage, expansion, later stage, buyout/acquisition, and other[92]. One stage with the greatest share of investments will be the stage that the lead PE firm is specialized in. We then created a dummy (*Stage specialization*) that equals 1 when the lead PE firm is specialized in buyout/acquisition stage, and 0 otherwise.

Different industry experience: the logarithm of buying PE firm's industry experience minus the logarithm of selling PE firm's industry experience.

Different investments/executive: buying PE firm's investments/executive minus selling PE firm's investments/executives.

Different stage specialization: a dummy variable that takes value of 1 if the buying PE firm is specialized in buyout/acquisition stage and the selling PE firm is not, and 0 otherwise.

PE fund characteristics:

Fund age: the difference between the vintage year and the SMBO transaction year.

Selling late: dummy variable that equals 1 if the selling PE fund age is greater than 8 years and 0 otherwise.

Buying late: dummy variable that equals 1 if the buying PE fund age is greater than 4 years and 0 otherwise

Dry powder: one minus the percentage of the sum of invested funds up to SMBO transaction year in the total raised fund. When regression, we will use the logarithm of dry powder.

Dry powder dummy: a dummy that equals 1 if dry powder is greater than 25% and 0 otherwise.

Deal Characteristics:

Primary (secondary) PE-backed: dummy variable that takes 1 if the target company is PE-backed in the primary (secondary) stage.

Club deals: dummy variable that equals 1 if there is more than one PE firm investing in the SMBO, and 0 otherwise.

Multiple investment: dummy variable that equals 1 if there is more than one investment round during the SMBO period and 0 otherwise.

Selling (Buying) PE Independent: dummy variable that takes the value of 1 when the Selling (Buying) PE firm is not an affiliate of the bank or insurance companies in the primary buyout (SMBO) transaction year, and 0 otherwise.

Primary/secondary duration: the number of months of the buyout holding period from entry date to exit date. For the regression, we will use the logarithm of duration.

Management participation: dummy variable that equals 1 if the target company's management contributes to the equity in secondary stage and 0 otherwise.

Other control variables: [93]

[92] According to Private Equity Glossary of Thomson One Banker, these six types are defined as follows: seed means these companies "have not yet fully established commercial operations, and may also involve continued research and product development" (Thomson One Banker, 2008); companies in early stage requires "product development and initial marketing, manufacturing and sales activities" (ibid); companies in expansion stage require "additional capital to expand production to increase revenue" (ibid) for venture capital investment and "use equity usually to expand operations on a national or international stage, possibly through acquisitions of smaller or similarly sized companies, or increased production" (ibid) for buyout investment; later stage refers to the stage in which companies "have an already established product or service that has already generated revenue, but may not be making a profit" (ibid); companies in buyout/acquisition stage are controlled or fully possessed by PE firms, an operating company, or conglomerate; others refers to none of the above stages apply.

[93] In order to maintain the number of observations, we use alternative measures for some control variables,

(Continued)

GEAR: The sum of long term and shot term debt divided by the total equity.
Previous performance: the performance ratios (*ROAt-1, ROSt-1, SALEMPt-1, EMPGt-1,* and *SALGt-1*) in year preceding the SMBO.
Crisis: A dummy variable which equals 1 if the year coincides with the years of financial crisis and 0 otherwise. The calendar years of 2008, 2009, and 2010 are defined as financial crisis years.
LNSIZE: The logarithm of total asset (in £ thousand) in one year before transaction.
Lambda: The fitted probability of receiving PE backing, estimated by equation 5.

including previous performance and size.

Table 4.6: Post-SMBO performance and buying late

This table reports the results of the GLS random-effects panel regression to examine the impact of buying late on post-SMBO performance, from year 1 to year 5 after SMBO transactions. The dependent variables are abnormal performance in profitability (*AROA* and *AROS*), productivity (*ASALEMP*), employment growth (*AEMPG*), and sales growth (*ASALG*). Panel A uses unadjusted abnormal performance while Panel B uses industry adjusted abnormal performance. Models in both Panel A and Panel B include entry year dummies and industry dummies. The results are based on 99% winsorized data. All parameters are estimated with robust standard error and omitted collinear covariates. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N is the number of firm-year observations used in each model. ***, **,* indicate the significance level at 1%, 5%, and 10 % respectively. Definitions of all variables are in Table 4.5.

Panel A: Unadjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying late	-0.044	-0.046	-0.008	-0.420**	-0.604**
	-0.572	-0.483	-0.037	-2.190	-1.990
Dry powder	-0.006	-0.003	-0.022	-0.036*	-0.095
	-0.445	-0.178	-0.461	-1.734	-1.517
Buying late* Dry powder	0.014	0.018	0.016	0.109**	0.166**
	0.769	0.831	0.306	2.455	2.248
Primary PE-backed	0.069***	0.045	-0.084	0.014	0.113
	2.883	1.386	-1.318	0.237	1.364
Club deals	0.026	0.083**	-0.052	0.022	0.021
	1.111	2.191	-0.888	0.339	0.288
Multiple investment	0.002	-0.038	0.010	0.052	-0.013
	0.104	-1.205	0.288	0.924	-0.194
Buying PE independent	0.022	0.017	-0.022	-0.036	0.023
	0.928	0.674	-0.482	-0.624	0.267
LNSIZE	-0.006	0.033	0.051	0.073	0.056
	-0.238	0.902	0.667	1.609	0.676
Secondary duration	-0.013	0.065	-0.024	-0.029	-0.161
	-0.226	0.944	-0.135	-0.267	-0.771
Crisis	-0.039***	-0.006	-0.013	-0.070	-0.139**
	-2.770	-0.326	-0.696	-1.406	-2.559
Management participation	0.032	0.017	-0.024	0.073*	0.041
	1.335	0.479	-0.377	1.682	0.499
GEAR	-0.012***	-0.018**	0.001	-0.006	0.007
	-2.696	-2.479	0.250	-0.506	0.471
Previous performance	-0.580***	-0.131	-0.114	-0.455***	-0.515***
	-4.428	-0.577	-0.925	-2.946	-3.470
Intercept	0.118	-0.098	0.304	-0.046	0.426
	0.617	-0.417	0.475	-0.144	0.599
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes
R square (%)	36.97	23.22	8.54	27.65	30.64
Wald chi2	132.977***	74.294***	32.944	199.919***	148.117***
N	317	265	231	263	247

Panel B: Industry adjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying late	-0.034	-0.067	-0.108	-0.224	-0.173
	-0.085	-0.812	-0.435	-1.057	-0.563
Dry powder	-0.091	-0.006	-0.028	-0.027	0.012
	-1.150	-0.322	-0.626	-0.879	0.206
Buying late* Dry powder	-0.032	0.024	0.041	0.062	0.074
	-0.338	1.239	0.694	1.157	0.941
Primary PE-backed	0.063	0.044	-0.018	-0.061	0.116
	1.020	1.360	-0.236	-1.465	1.413
Club deals	0.068	0.070*	-0.008	-0.006	0.029
	1.069	1.768	-0.089	-0.175	0.366
Multiple investment	0.103	-0.043	-0.068	0.072	-0.007
	0.842	-1.277	-0.869	1.519	-0.094
Buying PE independent	0.073	0.012	0.038	-0.152**	-0.019
	0.592	0.507	0.540	-2.177	-0.197
LNSIZE	0.051	0.009	0.120	0.039	0.074
	0.753	0.269	1.264	0.911	0.876
Secondary duration	-0.444	0.013	-0.102	-0.252*	-0.385
	-1.537	0.156	-0.502	-1.859	-1.532
Crisis	-0.038**	-0.004	-0.035*	-0.088	-0.098
	-2.332	-0.231	-1.858	-1.496	-1.614
Management participation	0.029	0.000	0.084	0.089*	0.061
	0.425	0.010	0.925	1.904	0.711
GEAR	-0.026**	-0.017**	0.008	-0.014	0.008
	-2.388	-2.340	0.866	-1.271	0.585
Previous performance	-1.030***	-0.247	-0.087	-0.275**	-0.487***
	-2.932	-1.010	-0.696	-2.054	-3.198
Intercept	-1.177	-0.029	-0.397	0.767**	0.044
	-0.752	-0.109	-0.479	2.072	0.059
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	NO	Yes	Yes	Yes
R square (%)	24.67**	19.53	12.63	22.31	40.04
Wald chi2	40.332**	163.322***	41.156***	252.681***	218.020***
N	305	253	224	208	239

Table 4.7: Post-SMBO performance and selling late

This table reports the results of the GLS random-effects panel regression to examine the impact of selling late on post-SMBO performance, from year 1 to year 5 after transactions. The dependent variables are abnormal performance in profitability (*AROA* and *AROS*), productivity (*ASALEMP*), employment growth (*AEMPG*), and sales growth (*ASALG*). Panel A uses unadjusted abnormal performance while Panel B uses industry adjusted abnormal performance. Models in Panel A include entry year dummies and industry dummies. Models in panel B only include entry year dummies. The results are based on 99% winsorized data. All parameters are estimated with a robust standard error and omitted collinear covariates. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N is the number of firm-year observations used in each model. ***, **,* indicate the significance level at 1%, 5%, and 10 % respectively. Definitions of all variables are in Table 4.5.

Panel A: Unadjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
Selling late	0.372**	-2.763	-0.154	-0.053	-0.604
	2.294	-0.944	-0.381	-0.159	-1.439
Primary duration	0.030	-0.083	0.071	-0.002	0.065
	0.924	-0.541	1.027	-0.035	0.948
Primary duration* Selling late	-0.093**	0.619	0.008	0.021	0.144
	-2.273	0.933	0.071	0.243	1.413
LNSIZE	-0.013	-0.273	0.023	0.003	-0.043
	-0.577	-0.966	0.247	0.059	-0.647
Secondary duration	-0.106*	0.561	-0.053	-0.342**	-0.028
	-1.808	0.944	-0.226	-2.004	-0.132
Crisis	0.001	0.133	0.026	-0.041	-0.116
	0.037	1.368	1.130	-0.715	-1.635
Secondary PE-backed	-0.023	-0.037	0.012	0.033	0.066
	-0.529	-0.265	0.109	0.633	0.847
Management participation	0.025	-0.116	0.022	-0.014	-0.012
	0.951	-0.744	0.365	-0.280	-0.194
GEAR	-0.011*	-0.064	0.004	0.008	-0.001
	-1.905	-1.561	1.019	0.566	-0.051
Previous performance	-0.459**	-0.423	-0.203*	-0.463***	-0.488***
	-2.376	-0.745	-2.024	-3.642	-3.944
Intercept	0.287*	1.830	0.424	0.700*	0.262
	1.739	1.192	0.875	1.883	0.606
Year dummy	Yes	Yes	NO[94]	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes
R square (%)	22.48	9.22	8.20	18.22	19.47
Wald chi2	254.273***	196.948***	33.503***	178.040***	218.115***
N	330	277	255	265	255

[94] We excluded the entry year dummies in this model, as Stata reports Wald chi2 and its p-value are missing. Excluding or including year dummies does not change the results. In Panel B, we excluded industry dummies for the same reason.

Panel B: Industry adjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
Selling late	0.411**	0.261	0.359	-0.078	-0.350
	2.199	1.404	0.998	-0.247	-0.765
Primary duration	0.032	0.023	0.121	0.014	0.023
	0.798	0.668	1.624	0.193	0.269
Primary duration* Selling late	-0.099**	-0.063	-0.117	0.018	0.085
	-2.057	-1.269	-1.160	0.215	0.746
LNSIZE	-0.013	-0.005	0.045	-0.003	-0.029
	-0.550	-0.140	0.533	-0.069	-0.384
Secondary duration	-0.219**	0.019	-0.251	-0.313	-0.300
	-2.629	0.266	-0.929	-1.381	-1.050
Crisis	0.027	0.021	-0.006	-0.095	-0.025
	0.984	0.961	-0.250	-1.559	-0.419
Secondary PE-backed	0.004	-0.014	-0.066	-0.005	0.044
	0.076	-0.494	-0.591	-0.087	0.452
Management participation	0.010	-0.049	-0.003	0.017	-0.018
	0.358	-1.563	-0.059	0.315	-0.200
GEAR	-0.010	-0.017**	0.004	-0.004	-0.002
	-1.467	-2.208	0.679	-0.272	-0.137
Previous performance	-0.469**	-0.242*	-0.196*	-0.546***	-0.581***
	-2.325	-1.937	-1.768	-5.190	-3.489
Intercept	0.386**	-0.003	0.216	0.798*	0.580
	2.151	-0.016	0.349	1.744	1.061
Year dummy	Yes	Yes	Yes	Yes	NO
R square (%)	17.99	14.98	6.94	12.69	14.83
Wald chi2	84.673***	505.015***	12.370	489.320***	21.090**
N	310	261	221	212	244

Table 4.8: Post-SMBO performance and buying PE firms' characteristics

This table reports the results of the GLS random-effects panel regression to examine the impact of buying PE firms' characteristics on post-SMBO performance, from year 1 to year 5 after SMBO transactions. The dependent variables are abnormal performance in profitability (*AROA* and *AROS*), productivity (*ASALEMP*), employment growth (*AEMPG*), and sales growth (*ASALG*). Panel A uses unadjusted abnormal performance while Panel B uses industry adjusted abnormal performance. Models in both Panel A and Panel B include entry year dummies and industry dummies. The results are based on 99% winsorized data. All parameters are estimated with a robust standard error and omitted collinear covariates. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N is the number of firm-year observations used in each model. ***, **,* indicate the significance level at 1%, 5%, and 10 % respectively. Definitions of all variables are in Table 4.5.

Panel A: Unadjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying industry experience	0.032	0.006	-0.023	0.042**	0.036*
	1.147	0.640	-1.008	2.418	1.752
Buying investments/executive	-0.006	-0.001	0.025**	-0.010	-0.014
	-0.284	-0.191	2.126	-0.990	-1.065
Buying stage specialization	-0.011	-0.030	-0.032	-0.091*	-0.117
	-0.123	-1.028	-0.444	-1.680	-1.400
Primary PE-backed	0.071	0.025	-0.031	-0.031	0.042
	1.431	1.092	-0.502	-0.641	0.575
Club deals	0.030	0.040	-0.046	-0.016	-0.025
	0.630	1.377	-0.789	-0.289	-0.425
Multiple investment	0.068	-0.026	-0.088	0.075*	0.015
	0.819	-1.269	-1.528	1.731	0.278
Buying PE independent	0.065	0.006	0.004	-0.051	0.034
	0.659	0.372	0.084	-1.401	0.669
LNSIZE	0.010	0.007	0.129*	0.024	0.027
	0.166	0.310	1.705	0.471	0.411
Secondary duration	-0.303	0.027	-0.009	0.007	-0.108
	-1.190	0.560	-0.062	0.054	-0.659
Crisis	-0.046***	-0.012	-0.005	-0.020	-0.112**
	-3.515	-0.945	-0.285	-0.332	-2.336
Management participation	0.062	0.022	0.023	0.037	0.042
	1.427	1.006	0.329	0.941	0.620
GEAR	-0.026***	-0.014***	0.004	-0.004	0.015
	-3.078	-3.141	0.855	-0.426	1.211
Previous performance	-0.606*	-0.202***	-0.072	-0.541***	-0.583***
	-1.709	-2.664	-0.860	-3.315	-3.590
Intercept	-1.178	0.059	-0.334	-0.012	0.158
	-0.874	0.435	-0.569	-0.038	0.332
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes
R square (%)	18.13	21.17	14.45	23.78	28.02
Wald chi2	63.151***	93.634***	32.197	196.004***	108.720***
N	415	350	324	332	314

Panel B: Industry adjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying industry experience	0.018**	0.004	-0.034	0.029	0.029
	2.477	0.442	-1.425	1.614	1.199
Buying investments/executive	-0.002	0.001	0.020	-0.014	-0.019
	-0.365	0.338	1.498	-1.243	-1.334
Buying stage specialization	0.034	-0.034	0.034	-0.021	-0.137
	1.281	-1.062	0.457	-0.377	-1.460
Primary PE-backed	0.056**	0.016	-0.032	-0.098**	0.041
	2.499	0.747	-0.482	-2.545	0.577
Club deals	0.013	0.014	-0.034	-0.033	0.013
	0.581	0.479	-0.498	-0.913	0.194
Multiple investment	-0.004	-0.024	-0.057	0.056	0.048
	-0.182	-1.236	-0.913	1.468	0.838
Buying PE independent	-0.016	0.010	0.054	-0.071*	0.039
	-0.716	0.563	1.013	-1.792	0.711
LNSIZE	-0.022	0.016	0.120	0.028	0.025
	-1.139	0.644	1.493	0.542	0.373
Secondary duration	-0.070	-0.014	-0.131	-0.036	-0.339*
	-1.345	-0.257	-0.813	-0.233	-1.684
Crisis	-0.028**	-0.012	-0.030*	-0.032	-0.067
	-2.162	-1.106	-1.853	-0.458	-1.269
Management participation	0.031	0.007	0.017	0.042	0.039
	1.559	0.337	0.251	1.083	0.543
GEAR	-0.019***	-0.011***	0.008	-0.007	0.017
	-4.535	-2.682	1.059	-0.752	1.455
Previous performance	-0.619***	-0.163**	-0.025	-0.330**	-0.574***
	-4.770	-2.354	-0.309	-2.177	-3.679
Intercept	0.221	0.041	-0.524	0.264	0.227
	1.406	0.272	-0.802	0.766	0.448
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	NO	Yes	Yes
R square (%)	34.78	19.08	12.21	16.71	37.85
Wald chi2	184.079***	92.572***	226.259***	208.152***	254.877***
N	401	329	284	277	306

Table 4.9: Post-SMBO performance and difference in PE firms' characteristics

This table reports the results of the GLS random-effects panel regression to examine the impact of difference in PE firms' characteristics on post-SMBO performance, from year 1 to year 5 after SMBO transactions. Panel A uses unadjusted abnormal performance while Panel B uses industry adjusted abnormal performance. Models include entry year dummies and industry dummies. The results are based on 99% winsorized data. All parameters are estimated with a robust standard error and omitted collinear covariates. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N is the number of firm-year observations used in each model. ***, **,* indicate the significance level at 1%, 5%, and 10 % respectively. Definitions of all variables are in Table 4.5.

Panel A: Unadjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
Different industry experience	0.002	0.001	-0.007	0.021	-0.000
	0.186	0.112	-0.455	1.389	-0.022
Different investments/executive	-0.000	-0.000	0.012	-0.015	0.007
	-0.012	-0.093	1.431	-1.623	0.733
Different stage specialization	-0.010	-0.048	-0.094*	-0.028	-0.222*
	-0.169	-1.253	-1.838	-0.444	-1.682
Club deals	0.051*	0.079**	-0.026	0.033	0.057
	1.761	1.981	-0.549	0.568	1.064
Multiple investment	-0.001	-0.052**	-0.020	0.072	-0.025
	-0.041	-2.380	-0.512	1.553	-0.467
Buying PE independent	0.013	-0.002	0.021	-0.037	-0.014
	0.446	-0.107	0.512	-0.744	-0.299
LNSIZE	0.015	0.006	0.084*	0.041	-0.003
	0.516	0.245	1.865	0.785	-0.041
Secondary duration	-0.100	0.005	0.027	-0.148	-0.250
	-1.574	0.103	0.240	-0.878	-1.499
Crisis	-0.022*	-0.006	0.010	0.020	-0.060
	-1.829	-0.361	0.500	0.237	-1.342
Management participation	0.038	0.014	-0.033	0.023	-0.011
	1.502	0.598	-0.737	0.463	-0.225
GEAR	-0.020	-0.015***	0.005	-0.007	0.017
	-3.622	-2.967	0.846	-0.642	1.556
Previous performance	-0.390***	-0.251***	-0.031	-0.522	-0.304**
	-2.753	-3.660	-0.476	-3.518***	-2.084
Intercept	0.141	0.122	-0.167	0.041	0.763*
	0.596	0.689	-0.455	0.100	1.711
Year dummy	Yes	Yes	Yes	Yes	NO
Industry dummy	Yes	Yes	Yes	Yes	Yes
R square (%)	24.44	28.46	23.35	21.86	16.15
Wald chi2	97.430***	2276.972***	47.338***	205.579***	112.742***
N	320	274	243	257	249

Panel B: Industry adjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
Different industry experience	0.043	0.002	-0.008	0.026*	-0.003
	1.163	0.074	-0.610	1.726	-0.101
Different investments/executive	-0.039	0.000	0.013*	-0.017**	-0.007
	-1.169	0.014	1.879	-2.074	-0.549
Different stage specialization	0.033	0.010	-0.031	-0.039	-0.141*
	0.570	0.143	-0.663	-0.903	-1.776
Club deals	-0.040	0.159	-0.053	0.004	0.086
	-0.569	1.604	-0.943	0.065	1.008
Multiple investment	0.083	-0.154**	-0.014	0.085**	0.022
	0.666	-2.090	-0.367	2.075	0.335
Buying PE independent	0.135	0.020	0.007	-0.062	0.085
	0.803	0.518	0.184	-1.193	1.193
LNSIZE	0.102	-0.005	0.065	0.022	0.021
	0.862	-0.078	1.475	0.453	0.353
Secondary duration	-0.389*	0.008	-0.054	-0.094	-0.213
	-1.790	0.044	-0.435	-0.347	-0.940
Crisis	-0.012	0.026	-0.016	-0.006	-0.081
	-0.782	0.608	-0.927	-0.064	-1.160
Management participation	0.053	-0.021	-0.045	0.061	-0.009
	1.011	-0.362	-1.056	1.293	-0.130
GEAR	-0.034***	-0.028**	0.006	-0.011	0.020**
	-3.132	-2.118	0.948	-0.971	1.967
Previous performance	-0.954**	-0.905***	-0.020	-0.589***	-0.270*
	-2.480	-2.774	-0.381	-5.431	-1.940
Intercept	-1.975	0.245	-0.103	0.025	-0.085
	-0.978	0.569	-0.311	0.043	-0.174
Year dummy	Yes	Yes	NO	Yes	YES
R square (%)	23.14	20.58	16.12	16.65	16.22
Wald chi2	31.663**	31.684**	18.686*	87.289***	66.297***
N	306	255	219	217	241

Table 4.10: Post-SMBO performance and buying late (dry powder dummy)

This table reports the results of GLS random-effects panel regression to examine the impact of buying late on post-SMBO abnormal performance, from year 1 to year 5 after SMBO transactions. *Dry powder dummy* is a dummy that equals 1 if dry powder is greater than 25% and 0 otherwise. Panel A uses unadjusted abnormal performance while Panel B uses industry adjusted abnormal performance. Models in both Panel A and Panel B include entry year dummies and industry dummies. The results are based on 99% winsorized data. All parameters are estimated with a robust standard error and omitted collinear covariates. Coefficients and z-statistics are reported. N is the number of firm-year observations used in each model. ***, **,* indicate the significance level at 1%, 5%, and 10 % respectively. Definitions of all variables are in Table 4.5.

Panel A: Unadjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying late	0.141	-0.863	-0.174	-0.239*	-0.409*
	0.574	-1.096	-0.777	-1.690	-1.948
Dry powder dummy	-0.266	-0.827*	-0.233	-0.169***	-0.445**
	-1.436	-1.656	-1.607	-2.815	-2.544
Buying late* Dry powder dummy	-0.270	1.015	0.212	0.243*	0.471**
	-0.859	1.211	0.893	1.797	2.206
Primary PE-backed	0.050	0.316	-0.033	0.004	0.091
	0.782	1.215	-0.511	0.071	1.075
Club deals	0.041	0.532**	-0.002	0.021	0.025
	0.738	1.974	-0.032	0.325	0.357
Multiple investment	0.135	-0.206	-0.070	0.071	0.017
	1.227	-0.584	-1.089	1.353	0.267
Buying PE independent	0.031	-0.348	-0.001	-0.034	0.032
	0.398	-0.663	-0.013	-0.642	0.382
LNSIZE	0.015	-0.004	0.116	0.035	0.009
	0.233	-0.008	1.216	0.740	0.116
Secondary duration	-0.514	0.321	0.006	-0.121	-0.315
	-1.393	0.584	0.026	-1.019	-1.466
Crisis	-0.048***	0.048	-0.007	-0.074	-0.141***
	-3.152	0.946	-0.389	-1.461	-2.609
Management participation	0.089	0.422	0.097	0.070	0.055
	1.242	1.124	0.956	1.464	0.666
GEAR	-0.022**	-0.096*	0.001	-0.002	0.010
	-2.168	-1.662	0.127	-0.207	0.725
Previous performance	-0.579	-1.133	-0.166	-0.490***	-0.561***
	-1.525	-1.100	-1.453	-3.036	-3.697
Intercept	-0.661	0.835	0.207	0.256	0.883
	-0.583	0.340	0.303	0.751	1.312
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes
R square (%)	20.98	14.92	14.29	25.66	30.53
Wald chi2	40.015*	38.674*	38.973*	198.851***	102.196***
N	319	267	248	265	249

Panel B: Industry adjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying late	-0.001	-0.030	-0.114	-0.320**	-0.050
	-0.021	-0.466	-0.701	-2.467	-0.239
Dry powder dummy	-0.039	-0.048	-0.215*	-0.171*	-0.115
	-0.897	-1.356	-1.837	-1.697	-0.725
Buying late* Dry powder dummy	-0.010	0.055	0.162	0.355**	0.144
	-0.153	0.775	0.908	2.614	0.652
Primary PE-backed	0.054**	0.041	-0.035	-0.065	0.112
	2.455	1.267	-0.465	-1.447	1.287
Club deals	0.032	0.070*	-0.001	0.015	0.039
	1.224	1.762	-0.015	0.342	0.471
Multiple investment	0.001	-0.036	-0.055	0.058	0.025
	0.055	-1.124	-0.794	1.254	0.362
Buying PE independent	0.002	0.010	0.043	-0.115*	-0.025
	0.063	0.419	0.626	-1.878	-0.267
LNSIZE	0.003	0.001	0.109	0.047	0.018
	0.119	0.019	1.266	1.200	0.213
Secondary duration	-0.075	-0.008	-0.163	-0.248*	-0.511*
	-1.101	-0.097	-0.786	-1.689	-1.849
Crisis	-0.032**	-0.004	-0.035*	-0.090	-0.098
	-2.082	-0.236	-1.872	-1.499	-1.618
Management participation	0.043*	-0.002	0.090	0.080*	0.048
	1.680	-0.051	0.963	1.723	0.565
GEAR	-0.015***	-0.017**	0.009	-0.009	0.009
	-3.201	-2.353	0.912	-0.770	0.646
Previous performance	-0.589***	-0.238	-0.089	-0.285**	-0.532***
	-4.207	-0.986	-0.790	-2.089	-3.415
Intercept	0.186	0.064	-0.159	0.810**	0.572
	0.948	0.258	-0.216	2.198	0.763
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	NO	NO	Yes	Yes
R square (%)	36.96	18.72	15.59	22.66	37.68
Wald chi2	125.633***	126.737***	35.202**	374.560***	147.492***
N	307	255	226	210	241

Table 4.11: Post-SMBO performance and buying PE firms' characteristics (restricted to delete unspecified fund data)

This table reports the results of the GLS random-effects panel regression to examine the impact of buying PE firms' characteristics on post-SMBO performance by using a subsample that excludes unspecified funds. Panel A uses unadjusted abnormal performance measures as dependent variables while Panel B uses industry adjusted abnormal performance measures as dependent variables. Models in both Panel A and Panel B include entry year dummies and industry dummies. The results are based on 99% winsorized data. All parameters are estimated with robust standard error and omitted collinear covariates. Coefficients and z-statistics are reported. N is the number of firm-year observations used in each model. ***, **,* indicate the significance level at 1%, 5%, and 10 % respectively. Definitions of all variables are in Table 4.5.

Panel A: Unadjusted abnormal performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying industry experience	0.014	-0.012	-0.053*	0.061***	0.052*
	1.447	-0.931	-1.727	2.681	1.788
Buying investments/executive	-0.002	0.006	0.032**	-0.023*	-0.026
	-0.259	0.829	2.184	-1.691	-1.464
Buying stage specialization	0.047*	-0.066	0.040	-0.125*	-0.198**
	1.772	-1.599	0.499	-1.812	-2.090
Primary PE-backed	0.090***	0.023	-0.024	-0.014	0.058
	2.931	0.786	-0.338	-0.243	0.696
Club deals	0.024	0.038	-0.002	-0.021	-0.035
	0.897	1.076	-0.035	-0.391	-0.536
Multiple investment	0.001	-0.024	-0.073	0.080	-0.016
	0.044	-0.920	-1.187	1.538	-0.244
Buying PE independent	-0.004	0.045	0.024	-0.070	-0.014
	-0.146	1.572	0.400	-1.531	-0.178
LNSIZE	-0.040	0.071*	0.173*	-0.013	-0.008
	-1.303	1.813	1.777	-0.239	-0.088
Secondary duration	0.001	0.011	-0.030	-0.035	-0.110
	0.016	0.178	-0.145	-0.312	-0.547
Crisis	-0.041***	-0.008	-0.013	-0.076	-0.140***
	-2.880	-0.648	-0.700	-1.574	-2.600
Management participation	0.049*	-0.025	0.022	0.083*	0.077
	1.852	-0.722	0.258	1.818	0.910
GEAR	-0.012***	-0.010*	-0.001	-0.002	0.012
	-2.561	-1.889	-0.161	-0.233	0.826
Previous performance	-0.770***	-0.156	-0.076	-0.540***	-0.578***
	-5.305	-0.916	-0.628	-3.117	-3.420
Intercept	0.277	-0.123	-0.413	0.212	0.442
	1.576	-0.562	-0.580	0.637	0.772
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes
R square (%)	40.37	22.42	12.91	28.26	29.38
Wald chi2	257.271***	72.542***	34.567	278.127***	89.194***
N	324	269	242	268	255

Panel B: Industry adjusted abnormal performance

industry	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying industry experience	0.033	-0.013	-0.015	0.052***	0.051
	0.698	-0.849	-0.761	3.123	1.519
Buying investments/executive	-0.017	0.007	0.013	-0.039***	-0.034*
	-0.522	1.136	1.233	-3.399	-1.785
Buying stage specialization	-0.022	-0.023	0.017	-0.088	-0.239**
	-0.205	-0.439	0.232	-1.589	-2.142
Primary PE-backed	0.076	0.026	-0.055	-0.124**	0.048
	1.178	0.833	-0.969	-2.558	0.592
Club deals	0.016	0.029	-0.038	-0.047	-0.003
	0.259	0.749	-0.846	-1.443	-0.044
Multiple investment	0.082	-0.027	-0.016	0.091**	0.017
	0.669	-0.940	-0.393	2.105	0.243
Buying PE independent	0.087	0.042	-0.039	-0.122**	-0.029
	0.624	1.308	-1.059	-2.391	-0.358
LNSIZE	0.034	0.053	0.088*	-0.014	-0.010
	0.567	1.272	1.685	-0.378	-0.109
Secondary duration	-0.317	-0.038	-0.092	-0.086	-0.357
	-1.462	-0.490	-0.632	-0.574	-1.420
Crisis	-0.038**	-0.008	-0.032*	-0.097*	-0.096
	-2.368	-0.617	-1.908	-1.661	-1.622
Management participation	0.055	-0.034	0.030	0.126***	0.091
	1.177	-1.068	0.538	2.989	1.077
GEAR	-0.025**	-0.010*	-0.001	-0.007	0.014
	-2.474	-1.910	-0.268	-0.751	0.967
Previous performance	-1.173***	-0.277	-0.122	-0.211**	-0.574***
	-2.868	-1.431	-1.445	-2.321	-3.505
Intercept	-1.689	-0.106	0.157	0.675**	0.580
	-0.966	-0.444	0.472	2.065	0.915
Year dummy	Yes	Yes	NO	Yes	Yes
Industry dummy	Yes	NO	Yes	Yes	Yes
R square (%)	24.06	15.27	12.15	25.15	39.18
Wald chi2	52.566***	35.088**	81.873***	205.838***	234.851***
N	312	257	224	213	247

Table 4.12: Sample selection bias

This table reports the results of the panel regression corrected for sample selection bias for the influence of the longevity of PE funds and the PE firms' characteristics on post-SMBO performance, up to five years after SMBO transactions. The Probit regression with robust variance estimate is for the probability of receiving PE backing by the sample SMBOs. This model converged after three iterations. The Panel regression is for the influence of the longevity of PE funds and the PE firms' characteristics on post-SMBO performance. The dependent variables (*AROA, AROS, ASALEMP, AEMPG*, and *ASALG*) are estimated as unadjusted abnormal performance ('level' model). *Lambda* is the fitted probability of receiving PE backing, estimated from the Probit model. All the results are based on 99% winsorized data. All parameters of panel regressions are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. Entry year dummies and industry dummies are included. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for profitability > Chi ^{2}. N reports the number of observations in the probit model and number of firm-year observations in the panel model respectively. ***, **,* are significance at 1%, 5%, and 10% level, respectively. Definitions of all variables are in Table 4.5.

Panel A: Probit regression

Independent variables	Coefficient
BSERVICES	-0.119*
LNSIZE	0.432***
ROAt-1	1.545***
Intercept	-1.462***
Log likelihood	-1112.3658
Pseudo R (%)	5.36
Wald chi2	76.83***
N	1875

Panel B: Buying fund

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying late	-0.041	-0.091	-0.392	-0.442**	-0.719**
	-0.528	-0.971	-1.967	-2.189	-2.571
Dry powder	-0.006	-0.009	-0.065	-0.038*	-0.112*
	-0.408	-0.480	-1.738	-1.805	-1.962
Buying late* Dry powder	0.013	0.030	0.103	0.113**	0.196***
	0.720	1.338	2.092	2.432	2.738
Primary PE-backed	0.063***	0.064*	-0.017	0.017	0.157*
	2.876	1.896	-0.297	0.281	1.759
Club deals	0.027	0.085**	0.017	0.024	0.031
	1.168	2.348	0.321	0.358	0.425
Multiple investment	0.002	-0.033	-0.018	0.051	-0.013
	0.086	-1.086	-0.395	0.901	-0.195
Buying PE independent	0.024	0.016	0.010	-0.039	0.015
	1.079	0.622	0.235	-0.672	0.179
LNSIZE	-0.085	0.122**	0.289**	0.104	0.198*
	-0.584	2.227	3.299	1.498	1.819
Secondary duration	-0.004	0.098	0.227	-0.012	-0.078
	-0.068	1.511	1.721	-0.113	-0.434
Crisis	-0.039***	-0.005	-0.018	-0.071	-0.138**
	-2.773	-0.282	-1.165	-1.425	-2.547
Management participation	0.031	0.007	0.080	0.070	0.019
	1.291	0.210	1.518	1.627	0.240
GEAR	-0.012***	-0.017**	0.001	-0.006	0.006
	-2.707	-2.443	0.343	-0.533	0.469

(Continued)					
Previous performance	-0.873*	0.069	-0.179	-0.451***	-0.510***
	-1.655	0.280	-1.633	-2.945	-3.943
Lambda	-0.398	0.539**	1.015**	0.195	0.943
	-0.559	2.235	2.563	0.784	1.616
Intercept	0.672	-0.769**	-1.326	-0.283	-0.716
	0.655	-2.032	-2.158	-0.642	-0.869
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes
R square (%)	37.11	24.50	15.82	27.74	31.81
Wald chi2	125.395***	58.619***	90.452**	205.880***	145.463***
N	317	265	231	263	247

Panel C: Selling fund

	AROA	AROS	ASALEMP	AEMPG	ASALG
Selling late	0.324*	-2.647	-0.149	-0.061	-0.613
	1.904	-0.984	-0.344	-0.183	-1.426
Primary duration	0.027	-0.074	0.051	-0.002	0.064
	0.827	-0.508	0.696	-0.031	0.928
Primary duration* Selling late	-0.081*	0.584	0.012	0.023	0.145
	-1.877	0.978	0.104	0.263	1.386
LNSIZE	0.202*	-0.373	-0.011	-0.008	-0.076
	1.867	-0.730	-0.083	-0.118	-0.925
Secondary duration	-0.117**	0.564	0.090	-0.345*	-0.044
	-2.014	0.989	0.445	-1.951	-0.200
Crisis	0.002	0.129	0.022	-0.041	-0.116
	0.098	1.393	0.939	-0.718	-1.634
Secondary PE-Backed	-0.014	-0.051	0.036	0.028	0.048
	-0.333	-0.372	0.353	0.509	0.645
Management participation	0.030	-0.113	0.001	-0.015	-0.012
	1.141	-0.734	0.009	-0.284	-0.194
GEAR	-0.012**	-0.065	0.002	0.009	-0.002
	-1.997	-1.472	0.327	0.571	-0.142
Previous performance	0.325	-0.621	-0.100	-0.465***	-0.467***
	0.716	-0.642	-1.043	-3.599	-3.558
Lambda	0.973*	-0.575	-0.227	-0.064	-0.270
	1.957	-0.383	-0.622	-0.274	-0.740
Intercept	-1.180*	2.477	0.281	0.781	0.582
	-1.674	0.821	0.374	1.540	0.918
Year dummy	Yes	Yes	NO	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes
R square (%)	23.02	9.54	8.09	18.06	19.22
Wald chi2	258.904***	838.334***	20.590	170.377***	208.161***
N	327	274	239	262	252

Panel D: Buying PE firms

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying industry experience	0.030	-0.038	0.001	0.046**	0.051**
	1.135	-0.619	0.091	2.571	2.096
Buying investments/executive	-0.006	0.008	0.011	-0.012	-0.019
	-0.279	0.214	1.449	-1.162	-1.444
Buying stage specialization	-0.023	0.258	0.043	-0.075	-0.076
	-0.254	1.261	0.785	-1.304	-0.850
Primary PE backed	0.059	0.285	-0.036	-0.027	0.069
	1.173	1.119	-0.764	-0.538	0.913
Club deals	0.031	0.453**	-0.035	-0.015	-0.024
	0.666	2.003	-0.817	-0.281	-0.417
Multiple investment	0.065	-0.126	-0.033	0.076*	0.018
	0.781	-0.471	-1.005	1.742	0.325
Buying PE independent	0.070	-0.303	0.004	-0.055	0.022
	0.704	-0.998	0.137	-1.546	0.418
LNSIZE	-0.140	0.075	0.156**	0.052	0.099
	-0.338	0.130	2.546	0.878	1.247
Secondary duration	-0.293	0.486	0.065	0.026	-0.040
	-1.114	1.074	0.690	0.205	-0.257
Crisis	-0.046***	0.061	-0.014	-0.019	-0.110**
	-3.512	1.170	-1.125	-0.316	-2.297
Management participation	0.060	0.228	0.020	0.035	0.035
	1.341	0.878	0.520	0.877	0.516
GEAR	-0.026***	-0.110***	0.001	-0.005	0.013
	-3.074	-2.230	0.288	-0.542	1.118
Previous performance	-1.170	-1.329***	-0.057	-0.539***	-0.575***
	-0.695	-1.755	-0.951	-3.340	-3.761
Lambda	-0.771	0.678	0.442	0.207	0.576
	-0.393	0.431	1.439	1.076	1.296
Intercept	-0.086	-1.077	-0.831	-0.275	-0.595
	-0.025	-0.301	-1.646	-0.698	-0.881
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes
R square (%)	18.22	14.17	17.87	23.92	28.49
Wald chi2	67.613***	79.579***	51.698***	205.236***	104.477***
N	415	350	312	332	314

Table 4.13: Selling late and buying early

This table reports the results of the GLS random-effects panel regression to examine the impact of buying PE firms' characteristics on post-SMBO performance with *Selling late/ Buying early* dummies and their interaction terms with buying PE firms' characteristics. The dependent variables are unadjusted abnormal performance in profitability (*AROA* and *AROS*), productivity (*ASALEMP*), employment growth (*AEMPG*), and sales growth (*ASALG*). Panel A includes *Selling late* dummy while Panel B includes *Buying early* dummy. Entry year dummies and industry dummies are included. The results are based on 99% winsorized data. All parameters are estimated with robust standard error and omitted collinear covariates. Coefficients and z-statistics are reported. N is the number of firm-year observations used in each model. ***, **,* indicate the significance level at 1%, 5%, and 10 % respectively. Definitions of all variables are in Table 4.5.

Panel A: Selling late

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying industry experience	0.016	-0.017	-0.003	0.066***	0.067**
	1.388	-0.591	-0.104	3.088	2.153
Buying investments/executive	0.005	0.021	0.006	-0.059***	-0.051***
	0.528	1.123	0.393	-3.591	-2.812
Buying stage specialization	0.023	-0.096	-0.051	-0.080	-0.173
	0.709	-0.995	-0.515	-0.925	-1.471
Selling late	0.142**	-0.025	0.084	0.174	0.120
	2.301	-0.113	0.551	1.224	0.433
Buying industry experience* Selling late	-0.033*	-0.066	-0.099**	-0.064*	-0.079
	-1.665	-1.005	-2.147	-1.774	-1.453
Buying investments/executive* Selling late	-0.008	0.057*	0.047	0.043	0.038
	-0.591	1.917	1.191	1.617	0.963
Buying stage specialization * Selling late	-0.050	0.050	0.019	-0.126	-0.026
	-1.144	0.239	0.118	-1.059	-0.127
Club deals	0.033	0.195**	-0.066	0.042***	0.030
	1.209	2.005	-1.181	0.794	0.575
Multiple investment	-0.008	-0.138*	0.024	0.151	0.043
	-0.324	-1.757	0.601	2.950	0.762
Buying PE independent	0.012	0.045	-0.004	-0.051	-0.054
	0.346	0.757	-0.065	-0.834	-0.572
LNSIZE	0.026	0.097	0.177***	0.001	-0.053
	0.872	1.158	3.116	0.024	-0.602
Secondary duration	-0.015	-0.031	0.243	-0.063	0.038
	-0.255	-0.215	1.543	-0.416	0.182
Crisis	-0.018	0.037	0.008	-0.071	-0.125**
	-1.308	0.703	0.367	-1.031	-2.023
Management participation	0.049*	-0.070	-0.043	0.117***	0.085
	1.787	-0.776	-0.801	3.150	1.527
GEAR	-0.016***	-0.029**	-0.001	-0.010	0.008
	-2.891	-1.968	-0.286	-0.850	0.717
Previous performance	-0.504***	0.145	-0.118*	-0.414***	-0.381**
	-3.517	0.212	-1.807	-4.386	-2.222
Intercept	0.047	0.112	-0.910*	0.340	0.620
	0.259	0.214	-2.037	0.873	1.239
Year dummy	Yes	Yes	Yes	Yes	NO
Industry dummy	Yes	Yes	NO	Yes	Yes
R square (%)	33.84	25.55	31.35	34.17	24.24
Wald chi2	4187.808***	406.255***	46.470***	953.678***	79.480***
N	240	205	180	197	193

Panel B: Buying early

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying industry experience	0.039**	0.024	0.115**	0.106**	0.073
	2.013	0.891	2.166	1.999	0.866
Buying investments/executive	-0.009	0.003	-0.008	-0.029**	-0.016
	-1.114	0.240	-0.311	-1.583	-0.588
Buying stage specialization	0.035	-0.127	-0.249*	-0.297	-0.307
	0.898	-1.307	-1.657	-2.056	-1.402
Buying early	-0.012	0.025	-0.101	-0.091	-0.063
	-0.192	0.295	-0.488	-0.650	-0.269
Buying industry experience *buying early	-0.032	-0.040	-0.197***	-0.052	-0.022
	-1.581	-1.303	-3.153	-0.967	-0.252
Buying investments / executive *buying early	0.011	0.006	0.062*	0.008	-0.013
	1.135	0.408	1.943	0.418	-0.345
Buying stage specialization *buying early	0.015	0.062	0.337**	0.257	0.178
	0.268	0.602	2.040	1.567	0.721
Primary PE backed	0.086***	0.006	-0.097	-0.018	0.076
	2.676	0.168	-1.209	-0.283	0.824
Club deals	0.022	0.034	-0.035	-0.028	-0.044
	0.807	0.978	-0.535	-0.494	-0.658
Multiple investment	0.003	-0.027	-0.098	0.072	-0.018
	0.115	-0.980	-1.535	1.348	-0.251
Buying PE independent	-0.002	0.042	-0.021	-0.078	-0.002
	-0.077	1.250	-0.248	-1.585	-0.018
LNSIZE	-0.037	0.078	0.181*	-0.024	-0.012
	-1.200	2.092	1.883	-0.459	-0.128
Secondary duration	0.003	0.027	-0.003	-0.016	-0.121
	0.050	0.434	-0.013	-0.148	-0.575
Crisis	-0.042***	-0.009	-0.013	-0.077	-0.142**
	-2.874	-0.656	-0.681	-1.542	-2.541
Management participation	0.046*	-0.022	0.019	0.085*	0.071
	1.708	-0.649	0.231	1.709	0.790
GEAR	-0.013***	-0.010*	-0.002	-0.002	0.012
	-2.637	-1.895	-0.408	-0.158	0.882
Previous performance	-0.750***	-0.137	-0.055	-0.530***	-0.558***
	-5.213	-0.761	-0.510	-3.034	-3.185
Intercept	0.235	-0.217	-0.572	0.282	0.465
	1.239	-0.976	-0.653	0.769	0.647
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes
R square (%)	41.01	27.31	24.51	29.19	30.63
Wald chi2	346.088***	61.752***	53.608***	233.507***	121.839***
N	317	263	237	265	249

Appendix 4.1: Sample selection

This table presents the sample selection process. The original population was obtained from CMBOR. We started our sample filter from collecting accounting information which has been finished in Chapter 2. Then we excluded SMBO cases that do not have PE backing in both primary and secondary phases by using various data sources, for example, synopses available from Thomson One Banker and PE firm websites. Our final sample was obtained after we excluded SMBOs for which we could not collect the detailed information of their backing PE firms. Finally, in order to investigate the influence of the longevity of PE funds on the performance of SMBOs, we established a subsample that does not include the SMBOs without exact fund names ("Unspecified funds").

Population: CMBOR 2000-2007	612
-Less: SMBOs from Financial industry; SMBOs with missing accounting information from FAME database.	-121
-Less: SMBOs are not backed by either selling or buying PE firms.	-218
-Less: SMBOs with missing detailed information of PE firms.	-46
Equals: Final sample	**227**
-Less: SMBOs without exact fund names	-41
Equals: Subsample for examining the relationship between the longevity of PE funds and performance of SMBOs	**186**

Appendix 4.2: Pearson correlation

This table shows Pearson correlation results of our variables. Panel A is for variables of selling fund and firms, while Panel B is for those of buying funds and firms.

Panel A: Selling fund and selling PE firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
ARROA(1)	1														
ARROS(2)	0.292	1													
	0.000														
ASALEMP(3)	0.182	0.271	1												
	0.000	0.000													
AREMPG(4)	0.086	0.301	0.146	1											
	0.070	0.000	0.005												
ARSALG(5)	0.199	0.374	0.386	0.672	1										
	0.000	0.000	0.000	0.000											
Selling late(6)	0.015	-0.097	-0.105	0.050	-0.016	1									
	0.745	0.052	0.043	0.335	0.767										
Primary duration(7)	-0.010	-0.038	-0.088	-0.008	0.025	0.395	1								
	0.813	0.424	0.067	0.863	0.623	0.000									
Selling industry experience (8)	0.037	0.018	0.091	0.075	0.140	0.039	-0.002	1							
	0.401	0.722	0.075	0.142	0.009	0.229	0.942								
Selling investments / executive (9)	0.032	0.117	0.073	0.040	-0.015	0.071	0.109	0.516	1						
	0.477	0.019	0.154	0.441	0.784	0.032	0.001	0.000							
Selling stage specialization (10)	0.004	0.220	0.023	0.087	0.108	-0.031	0.100	0.012	0.035	1					
	0.921	0.000	0.655	0.086	0.040	0.345	0.002	0.722	0.293						
LNSIZE(11)	-0.009	0.047	0.047	0.123	0.200	-0.038	0.103	0.146	-0.187	0.088	1				
	0.818	0.303	0.309	0.008	0.000	0.244	0.001	0.000	0.000	0.006					
Secondary duration(12)	-0.130	0.031	0.122	-0.035	-0.080	-0.051	-0.013	0.060	0.104	0.004	-0.074	1			
	0.001	0.503	0.009	0.454	0.103	0.117	0.682	0.066	0.001	0.906	0.013				
Crisis(13)	0.002	0.124	-0.094	0.046	0.078	0.125	-0.021	0.047	-0.173	-0.121	-0.012	-0.149	1		
	0.954	0.006	0.044	0.322	0.111	0.000	0.507	0.150	0.000	0.000	0.694	0.000			
Secondary PE-backed (14)	-0.052	-0.047	0.060	0.033	0.056	0.101	-0.003	0.037	-0.088	-0.014	0.208	-0.043	0.081	1	
	0.204	0.300	0.198	0.473	0.252	0.002	0.932	0.252	0.007	0.658	0.000	0.151	0.007		
Management participation(15)	0.071	0.099	0.040	-0.010	-0.038	0.003	0.058	-0.095	0.104	0.059	-0.217	0.062	-0.172	-0.173	1
	0.081	0.029	0.389	0.831	0.439	0.932	0.060	0.003	0.001	0.068	0.000	0.037	0.000	0.000	
GEAR(16)	-0.028	-0.170	0.037	-0.041	-0.014	-0.018	0.065	0.059	0.037	0.031	0.066	-0.053	-0.089	-0.028	0.015
	0.533	0.000	0.460	0.410	0.785	0.691	0.130	0.198	0.420	0.489	0.116	0.205	0.034	0.505	0.728

Panel B: Buying fund and buying PE firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
ARROA(1)	1																	
ARROS(2)	0.292	1																
	0.000																	
ASALEMP(3)	0.182	0.271	1															
	0.000	0.000																
AREMPG(4)	0.086	0.301	0.146	1														
	0.070	0.000	0.005															
ARSALG(5)	0.199	0.374	0.386	0.672	1													
	0.000	0.000	0.000	0.000														
Buying late(6)	0.010	0.077	0.045	0.038	0.054	1												
	0.831	0.123	0.380	0.458	0.319													
Dry powder (7)	-0.004	-0.071	-0.026	0.075	0.055	-0.289	1											
	0.938	0.164	0.619	0.145	0.315	0.000												
Buying industry experience (8)	0.014	-0.098	-0.034	0.088	0.045	0.244	0.004	1										
	0.762	0.047	0.499	0.080	0.403	0.000	0.894											
Buying investments/executive(9)	-0.006	-0.057	0.085	0.031	-0.094	0.215	0.021	0.552	1									
	0.891	0.254	0.098	0.546	0.080	0.000	0.538	0.000										
Buying stage specialization (10)	-0.021	-0.017	-0.015	-0.061	-0.048	-0.160	0.030	0.035	-0.093	1								
	0.625	0.721	0.766	0.216	0.361	0.000	0.365	0.285	0.005									
Primary PE-backed(11)	0.022	0.090	-0.026	0.052	0.158	0.038	-0.043	-0.004	-0.078	-0.044	1							
	0.594	0.049	0.580	0.264	0.001	0.247	0.200	0.892	0.017	0.166								
Club deals (12)	-0.045	0.026	0.009	0.058	0.040	-0.123	0.096	0.056	-0.068	-0.147	-0.079	1						
	0.269	0.569	0.844	0.215	0.421	0.000	0.004	0.083	0.040	0.000	0.008							
Multiple investment(13)	0.028	-0.068	-0.072	-0.029	-0.008	-0.086	0.095	0.094	0.016	0.042	0.055	0.162	1					
	0.496	0.136	0.121	0.539	0.876	0.008	0.004	0.004	0.637	0.185	0.064	0.000						
Buying PE independent(14)	-0.013	-0.023	0.002	-0.012	0.058	0.156	-0.111	0.079	0.253	0.037	-0.044	0.019	0.004	1				
	0.744	0.614	0.960	0.792	0.235	0.000	0.001	0.014	0.000	0.244	0.140	0.514	0.882					
LNSIZE(15)	-0.009	0.047	0.047	0.123	0.200	-0.034	0.004	0.074	-0.141	-0.101	0.225	0.137	0.165	-0.026	1			
	0.818	0.303	0.309	0.008	0.000	0.303	0.912	0.023	0.000	0.002	0.000	0.000	0.000	0.392				
Secondary duration(16)	-0.130	0.031	0.122	-0.035	-0.080	0.136	-0.184	-0.045	0.131	-0.025	0.014	-0.046	-0.036	0.108	-0.074	1		
	0.001	0.503	0.009	0.454	0.103	0.000	0.000	0.168	0.000	0.429	0.628	0.123	0.223	0.000	0.013			
Crisis(17)	0.002	0.124	-0.094	0.046	0.078	0.064	0.007	0.077	-0.063	-0.046	0.011	0.013	0.067	-0.032	-0.012	-0.149	1	
	0.954	0.006	0.044	0.322	0.111	0.050	0.828	0.018	0.053	0.147	0.723	0.656	0.023	0.276	0.694	0.000		
Management participation(18)	0.071	0.099	0.040	-0.010	-0.038	0.069	-0.044	-0.016	0.187	0.040	-0.070	-0.044	-0.100	0.171	-0.217	0.062	-0.172	1
	0.081	0.029	0.389	0.831	0.439	0.035	0.185	0.619	0.000	0.214	0.018	0.137	0.001	0.000	0.000	0.037	0.000	
GEAR(19)	-0.028	-0.170	0.037	-0.041	-0.014	0.046	-0.024	0.079	0.035	0.078	0.048	-0.048	0.024	-0.060	0.066	-0.053	-0.089	0.015
	0.533	0.000	0.460	0.410	0.785	0.330	0.607	0.085	0.448	0.085	0.247	0.248	0.567	0.152	0.116	0.205	0.034	0.728

Appendix 4.3: Sample selection bias with industry adjusted performance measures

This table reports the results of the panel regression corrected for sample selection bias for the influence of the longevity of PE funds and the PE firms' characteristics on post-SMBO performance, up to five years after SMBO transactions. The Panel regression is for the influence of the longevity of PE funds and the PE firms' characteristics on post-SMBO performance. The dependent variables (*AROA, AROS, ASALEMP, AEMPG,* and *ASALG*) are estimated as industry adjusted abnormal performance ('change' model). *Lambda* is the fitted probability of receiving PE backing, estimated from the Probit model in Panel A of Table 4.12. All the results are based on 99% winsorized data. All parameters of panel regressions are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. Entry year dummies and industry dummies are included. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi^2) are for probability > Chi^2. N reports the number of observations in the Probit model and number of firm-year observations in the panel model respectively. ***, **,* are significance at 1%, 5%, and 10% level, respectively. Definitions of all variables are in Table 4.5.

Panel A: Buying fund

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying late	-0.057	-0.016	-0.199	-0.220	-0.256
	-0.138	-0.218	-0.918	-1.027	-0.818
Dry powder	-0.096	0.007	-0.046	-0.033	0.000
	-1.159	0.427	-1.118	-0.994	-0.002
Buying late* Dry powder	-0.026	0.016	0.068	0.063	0.094
	-0.275	0.837	1.231	1.189	1.155
Primary PE-backed	0.037	0.057	0.037	-0.064	0.146*
	0.551	1.624	0.437	-1.519	1.648
Club deals	0.068	0.068*	-0.014	-0.014	0.038
	1.051	1.918	-0.175	-0.347	0.476
Multiple investment	0.106	-0.041	-0.050	0.078	-0.006
	0.848	-1.195	-0.678	1.583	-0.078
Buying PE independent	0.082	0.006	-0.009	-0.153**	-0.017
	0.656	0.222	-0.157	-2.202	-0.176
LNSIZE	-0.303	0.136**	0.320**	0.000	0.180
	-0.753	2.317	2.195	-0.008	1.485
Secondary duration	-0.393	0.116	0.057	-0.283	-0.290
	-1.480	1.501	0.320	-2.120	-1.219
Crisis	-0.039**	0.002	-0.031*	-0.086	-0.098
	-2.332	0.107	-1.678	-1.466	-1.615
Management participation	0.015	-0.010	0.052	0.091**	0.038
	0.203	-0.280	0.787	1.990	0.435
GEAR	-0.026**	-0.020***	0.006	-0.014	0.008
	-2.387	-2.829	0.810	-1.318	0.605
Previous performance	-2.351	0.107	-0.198*	-0.258**	-0.483***
	-1.418	0.442	-1.959	-1.983	-3.455
Lambda	-1.728	0.618**	1.379**	-0.254	0.696
	-0.876	2.383	2.360	-0.911	1.070
Intercept	1.269	-0.946**	-1.596	1.145**	-0.900
	0.412	-2.229	-1.591	2.126	-0.850
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	NO	Yes	Yes	Yes
R square (%)	24.65	20.65	11.83	22.56	40.02
Wald chi2	40.651*	48.907***	26.339**	189.667***	241.211***
N	305	253	219	208	239

Panel B: Selling fund

	AROA	AROS	ASALEMP	AEMPG	ASALG
Selling late	0.414**	0.237	0.141	-0.079	-0.353
	2.243	1.257	0.443	-0.245	-0.795
Primary duration	0.033	0.018	0.078	0.014	0.024
	0.826	0.514	1.133	0.186	0.285
Primary duration* Selling late	-0.100**	-0.056	-0.054	0.018	0.088
	-2.097	-1.119	-0.627	0.215	0.789
LNSIZE	-0.028	0.054	0.003	-0.005	-0.104
	-0.329	1.124	0.031	-0.080	-1.097
Secondary duration	-0.217***	0.042	0.012	-0.314	-0.370
	-2.639	0.570	0.065	-1.377	-1.280
Crisis	0.027	0.024	-0.006	-0.095	-0.027
	0.982	1.078	-0.231	-1.555	-0.457
Secondary PE-Backed	0.004	-0.001	-0.002	-0.005	0.015
	0.064	-0.050	-0.028	-0.087	0.157
Management participation	0.010	-0.047	-0.008	0.016	-0.015
	0.355	-1.611	-0.143	0.310	-0.168
GEAR	-0.010	-0.016**	0.004	-0.004	-0.003
	-1.429	-2.115	0.689	-0.262	-0.209
Previous performance	-0.519	-0.139	-0.068	-0.546***	-0.566***
	-1.254	-0.957	-0.855	-5.070	-3.457
Lambda	-0.064	0.320**	-0.218	-0.015	-0.540
	-0.169	2.059	-0.732	-0.065	-1.549
Intercept	0.483	-0.465	-0.107	0.817	1.284*
	0.799	-1.460	-0.161	1.479	1.929
Year dummy	Yes	Yes	Yes	Yes	NO
R square (%)	17.99	16.57	9.00	12.67	15.51
Wald chi2	83.697***	998.425***	13.381	489.860***	29.850**
N	310	261	221	212	244

Panel C: Buying firms

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying industry experience	0.017**	0.008	-0.018	0.030	0.037
	2.265	0.831	-0.910	1.592	1.336
Buying investments/executive	-0.002	0.000	0.014	-0.014	-0.023
	-0.364	0.074	1.137	-1.270	-1.507
Buying stage specialization	0.025	-0.025	0.052	-0.017	-0.109
	0.909	-0.790	0.723	-0.280	-1.099
Primary PE backed	0.047*	0.024	-0.005	-0.096**	0.058
	1.978	1.022	-0.075	-2.444	0.800
Club deals	0.013	0.015	-0.020	-0.031	0.015
	0.603	0.532	-0.284	-0.842	0.220
Multiple investment	-0.005	-0.022	-0.055	0.056	0.050
	-0.264	-1.130	-0.894	1.456	0.886
Buying PE independent	-0.012	0.009	0.039	-0.071*	0.034
	-0.600	0.495	0.764	-1.829	0.627
LNSIZE	-0.135	0.044	0.209*	0.035	0.072
	-1.066	1.096	1.881	0.613	0.884
Secondary duration	-0.057	0.008	-0.018	-0.030	-0.283
	-1.094	0.146	-0.120	-0.200	-1.427
Crisis	-0.029**	-0.012	-0.030*	-0.032	-0.066
	-2.177	-1.086	-1.837	-0.450	-1.256
Management participation	0.029	0.004	0.027	0.040	0.031
	1.439	0.198	0.404	1.056	0.434
GEAR	-0.019***	-0.011***	0.007	-0.007	0.016
	-4.525	-2.707	0.984	-0.769	1.388
Previous performance	-1.045**	-0.125	-0.067	-0.331**	-0.567***
	-2.200	-1.526	-0.864	-2.160	-3.785
Lambda	-0.576	0.193	0.642	0.055	0.375
	-0.881	1.066	1.383	0.242	0.781
Intercept	1.027	-0.234	-1.423	0.190	-0.301
	1.099	-0.738	-1.543	0.455	-0.395
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	NO	Yes	Yes
R square (%)	35.09	19.58	13.88	16.72***	37.73
Wald chi2	229.001***	89.844***	237.270***	210.657	266.588***
N	401	329	284	277	306

Appendix 4.4: Selling late and buying early with industry adjusted performance measures

This table reports the results of the GLS random-effects panel regression to examine the impact of buying PE firms' characteristics on post-SMBO performance with *Selling late/ Buying early* dummies and their interaction terms with buying PE firms' characteristics. The dependent variables are industry adjusted abnormal performance in profitability (*AROA* and *AROS*), productivity (*ASALEMP*), employment growth (*AEMPG*), and sales growth (*ASALG*). Panel A includes *Selling late* dummy while Panel B includes *Buying early* dummy. Entry year dummies and industry dummies are included. The results are based on 99% winsorized data. All parameters are estimated with robust standard error and omitted collinear covariates. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N is the number of firm-year observations used in each model. ***, **,* indicate the significance level at 1%, 5%, and 10 % respectively. Definitions of all variables are in Table 4.5.

Panel A: Selling late

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying industry experience	0.012	-0.034	-0.009	0.054*	0.051
	0.886	-0.850	-0.288	1.964	1.281
Buying investments/executive	0.013	0.027	0.004	-0.062***	-0.048**
	1.140	1.327	0.262	-3.833	-2.297
Buying stage specialization	0.041	-0.053	-0.069	-0.015	-0.152
	0.962	-0.437	-0.826	-0.249	-1.009
Selling late	0.104	0.161	0.247	0.222	0.071
	1.240	0.493	1.274	1.322	0.224
Buying industry experience* Selling late	-0.017	-0.114	-0.120***	-0.031	-0.028
	-0.718	-1.320	-2.944	-0.592	-0.429
Buying investments/executive* Selling late	-0.016	0.097**	0.048	0.025	-0.011
	-1.058	2.213	1.557	0.706	-0.197
Buying stage specialization * Selling late	-0.022	-0.135	-0.094	-0.204*	0.053
	-0.367	-0.508	-0.526	-1.791	0.231
Club deals	0.031	0.225**	-0.047	0.017	0.114
	1.065	2.204	-0.756	0.287	1.347
Multiple investment	-0.038	-0.170**	0.020	0.159***	0.047
	-1.246	-2.127	0.479	2.629	0.650
Buying PE independent	-0.006	0.030	-0.007	-0.058	0.043
	-0.172	0.507	-0.123	-0.905	0.396
LNSIZE	0.009	0.126	0.237***	-0.010	-0.078
	0.267	1.499	4.190	-0.185	-0.765
Secondary duration	-0.080	-0.099	0.279*	-0.173	-0.375
	-1.177	-0.548	1.814	-0.762	-1.336
Crisis	-0.012	0.040	-0.022	-0.114	-0.104
	-0.783	0.743	-0.977	-1.397	-1.400
Management participation	0.023	-0.054	0.016	0.169***	0.052
	0.752	-0.515	0.272	2.982	0.910
	-	-0.031*	-0.001	-0.010	0.011
GEAR	0.020***				
	-2.924	-1.942	-0.216	-0.659	0.863
	-	0.124	-0.120**	-0.315*	-0.329*
Previous performance	0.618***				
	-3.752	0.156	-2.102	-1.849	-1.701
Intercept	0.266	0.087	-1.934***	0.726	1.433**
	1.303	0.147	-3.597	1.630	2.322
Year dummy	Yes	Yes	Yes	Yes	NO
Industry dummy	Yes	Yes	NO	Yes	Yes
R square (%)	30.06	25.55	34.74	34.17	31.46
Wald chi2	-	-	69.400***	-	-
N	227	193	168	161	185

Panel B: Buying early

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying industry experience	0.289	0.046	0.083	0.077*	0.081
	1.402	1.350	1.625	1.874	0.832
Buying investments/executive	-0.117	0.003	-0.013	-0.041**	0.001
	-1.275	0.134	-0.450	-2.527	0.026
Buying stage specialization	-0.571	-0.175	-0.180	-0.158	-0.301
	-1.250	-1.384	-0.896	-1.499	-1.199
Buying early	-0.228	0.016	-0.196	-0.080	0.113
	-0.806	0.095	-0.917	-0.824	0.455
Buying industry experience *buying early	-0.314	-0.088**	-0.140**	-0.029	-0.042
	-1.498	-2.160	-2.386	-0.681	-0.424
Buying investments / executive *buying early	0.148	0.028	0.052	0.001	-0.045
	1.500	1.277	1.536	0.036	-1.139
Buying stage specialization *buying early	0.613	0.112	0.265	0.151	0.126
	1.334	0.658	1.204	1.323	0.441
Primary PE backed	-0.035	0.044	-0.068	-0.128**	0.080
	-0.330	0.734	-0.751	-2.459	0.864
Club deals	-0.008	0.095	-0.068	-0.052	0.001
	-0.123	1.406	-0.978	-1.421	0.010
Multiple investment	0.040	-0.135*	-0.084	0.093**	0.015
	0.392	-1.840	-1.052	2.188	0.204
Buying PE independent	0.038	0.029	-0.065	-0.146**	0.004
	0.346	0.455	-0.854	-2.460	0.035
LNSIZE	0.041	0.043	0.129	-0.021	0.000
	0.665	0.514	1.422	-0.534	-0.005
Secondary duration	-0.182	-0.103	-0.148	-0.079	-0.323
	-1.066	-0.552	-0.708	-0.543	-1.207
Crisis	-0.038**	0.017	-0.031	-0.098	-0.100
	-2.298	0.463	-1.634	-1.596	-1.619
Management participation	0.058	-0.036	0.022	0.119***	0.076
	0.984	-0.536	0.236	2.662	0.842
GEAR	-0.022**	-0.027*	0.005	-0.009	0.014
	-2.344	-1.804	0.575	-0.775	1.029
Previous performance	-1.233***	-0.121	-0.128	-0.179**	-0.524***
	-2.659	-0.190	-1.119	-2.523	-3.059
Intercept	-1.709	0.070	0.254	0.764**	0.371
	-1.056	0.121	0.385	2.199	0.488
Year dummy	Yes	Yes	NO	Yes	Yes
Industry dummy	Yes	NO	Yes	Yes	Yes
R square (%)	26.66	15.06	16.64	26.21	41.25
Wald chi2	50.277***	46.429***	111.412***	294.218***	263.184***
N	306	251	221	210	241

Appendix 4.5: Selling early and buying late

This table reports the results of the GLS random-effects panel regression to examine the impact of buying PE firms' characteristics on post-SMBO performance with *Selling early/ Buying late* dummies and their interaction terms with buying PE firms' characteristics. The dependent variables are unadjusted abnormal performance in profitability (*AROA* and *AROS*), productivity (*ASALEMP*), employment growth (*AEMPG*), and sales growth (*ASALG*). Panel A includes *Selling early* dummy while Panel B includes *Buying late* dummy. Entry year dummies and industry dummies are included. The results are based on 99% winsorized data. All parameters are estimated with robust standard error and omitted collinear covariates. Coefficients and z-statistics are reported. P-values for the Wald test (Wald Chi ^{2}) are for probability > Chi ^{2}. N is the number of firm-year observations used in each model. ***, **,* indicate the significance level at 1%, 5%, and 10 % respectively. Definitions of all variables are in Table 4.5.

Panel A: Selling early

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying industry experience	-0.016	-0.084	-0.103**	0.003	-0.013
	-1.080	-1.280	-2.502	0.077	-0.279
Buying investments/executive	-0.002	0.078**	0.054*	-0.017	-0.013
	-0.247	2.327	1.647	-0.747	-0.345
Buying stage specialization	-0.027	-0.046	-0.031	-0.206**	-0.199
	-0.981	-0.242	-0.239	-2.211	-1.219
Selling early	-0.142**	0.025	-0.094	-0.174	-0.120
	-2.301	0.113	-0.611	-1.224	-0.433
Buying industry experience* Selling early	0.033*	0.066	0.101**	0.064*	0.079
	1.665	1.005	2.158	1.774	1.453
Buying investments/executive* Selling early	0.008	-0.057*	-0.044	-0.043	-0.038
	0.591	-1.917	-1.115	-1.617	-0.963
Buying stage specialization * Selling early	0.050	-0.050	-0.017	0.126	0.026
	1.144	-0.239	-0.108	1.059	0.127
Club deals	0.033	0.195**	-0.068	0.042	0.030
	1.209	2.005	-1.185	0.794	0.575
Multiple investment	-0.008	-0.138*	0.016	0.151***	0.043
	-0.324	-1.757	0.418	2.950	0.762
Buying PE independent	0.012	0.045	-0.008	-0.051	-0.054
	0.346	0.757	-0.149	-0.834	-0.572
LNSIZE	0.026	0.097	0.171***	0.001	-0.053
	0.872	1.158	3.002	0.024	-0.602
Secondary duration	-0.015	-0.031	0.238	-0.063	0.038
	-0.255	-0.215	1.492	-0.416	0.182
Crisis	-0.018	0.037	0.008	-0.071	-0.125**
	-1.308	0.703	0.369	-1.031	-2.023
Management participation	0.049*	-0.070	-0.047	0.117***	0.085
	1.787	-0.776	-0.879	3.150	1.527
GEAR	-0.016***	-0.029*	-0.001	-0.010	0.008
	-2.891	-1.968	-0.286	-0.850	0.717
Previous performance	-0.504***	0.145	-0.126*	-0.414***	-0.381**
	-3.517	0.212	-1.835	-4.386	-2.222
Intercept	0.190	0.087	-0.775	0.514	0.741
	1.017	0.145	-1.607	1.223	1.313
Year dummy	Yes	Yes	Yes	Yes	NO
Industry dummy	Yes	Yes	NO	Yes	Yes
R square (%)	33.84	25.55	30.72	34.17	24.24
Wald chi2	4187.808***	406.255***	44.664***	953.678***	79.480***
N	240	205	182	197	193

Panel B: Buying late

	AROA	AROS	ASALEMP	AEMPG	ASALG
Buying industry experience	0.007	-0.017	-0.082**	0.054**	0.051
	0.656	-1.185	-2.422	2.352	1.628
Buying investments/executive	0.002	0.009	0.054***	-0.021	-0.028
	0.287	1.037	2.988	-1.345	-1.183
Buying stage specialization	0.050	-0.065*	0.088	-0.040	-0.130
	1.191	-1.776	0.984	-0.528	-1.383
Buying late	0.012	-0.025	0.101	0.091	0.063
	0.192	-0.295	0.488	0.650	0.269
Buying industry experience *buying late	0.032	0.040	0.197***	0.052	0.022
	1.581	1.303	3.153	0.967	0.252
Buying investments / executive *buying late	-0.011	-0.006	-0.062*	-0.008	0.013
	-1.135	-0.408	-1.943	-0.418	0.345
Buying stage specialization *buying late	-0.015	-0.062	-0.337**	-0.257	-0.178
	-0.268	-0.602	-2.040	-1.567	-0.721
Primary PE backed	0.086***	0.006	-0.097	-0.018	0.076
	2.676	0.168	-1.209	-0.283	0.824
Club deals	0.022	0.034	-0.035	-0.028	-0.044
	0.807	0.978	-0.535	-0.494	-0.658
Multiple investment	0.003	-0.027	-0.098	0.072	-0.018
	0.115	-0.980	-1.535	1.348	-0.251
Buying PE independent	-0.002	0.042	-0.021	-0.078	-0.002
	-0.077	1.250	-0.248	-1.585	-0.018
LNSIZE	-0.037	0.078**	0.181*	-0.024	-0.012
	-1.200	2.092	1.883	-0.459	-0.128
Secondary duration	0.003	0.027	-0.003	-0.016	-0.121
	0.050	0.434	-0.013	-0.148	-0.575
Crisis	-0.042***	-0.009	-0.013	-0.077	-0.142**
	-2.874	-0.656	-0.681	-1.542	-2.541
Management participation	0.046*	-0.022	0.019	0.085*	0.071
	1.708	-0.649	0.231	1.709	0.790
GEAR	-0.013***	-0.010*	-0.002	-0.002	0.012
	-2.637	-1.895	-0.408	-0.158	0.882
Previous performance	-0.750***	-0.137	-0.055	-0.530***	-0.558***
	-5.213	-0.761	-0.510	-3.034	-3.185
Intercept	0.224	-0.192	-0.674	0.191	0.402
	1.319	-0.922	-0.928	0.598	0.691
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes
R square (%)	41.01	27.31	24.51	29.19	30.63
Wald chi2	346.088***	61.752***	53.608***	233.507***	121.839***
N	317	263	237	265	249

CONCLUSION

This thesis has empirically examined operating performance up to five years after SMBO transactions and its relationships with leverage and managerial ownership, with a relatively comprehensive dataset of UK SMBOs completed during 2000 and 2007, in an attempt to draw a picture of how SMBOs affect the operating performance of target companies and improve our current understanding of the recent SMBO surge. Our dataset also allows us, for the first time, to fully investigate the transformation of the board of directors after SMBO transactions and its influence on post-SMBO operating performance, revealing new insights into the role of the board of directors in private companies (e.g. buyouts) and how SMBOs overcome the corporate governance challenges. Besides, this thesis, as the first study, examines the impact of the longevity of PE funds (fund pressures) and the variance among PE firms (competitive advantages) on post-SMBO operating performance, shedding some light on PE firms' investment behavior and their performance in terms of competitive advantage.

In Chapter 2, we firstly examined the post-SMBO operating performance in terms of profitability (*ROA* and *ROS*), productivity (sales per employee), and growth (employment growth and sales growth) from the first year to the fifth year after SMBO transactions. Then, we used leverage and managerial ownership as explanatory variables to examine their respective impact on post-SMBO operating performance in a panel data analysis.

The results from the univariate analysis demonstrate a significant reduction in profitability and growth for both unadjusted and industry adjusted measures after SMBO transactions. Moreover, the industry adjusted measures show worse performance than unadjusted measures. With reference to productivity, although the unadjusted measure

evidences significant improvement, the industry adjusted measure shows significant decreases during the SMBO phase. These results are robust to alternative profitability measures and matching methods for the benchmark. For instance, we collected a control group of primary private–to-private MBOs and used the Propensity Score Matching (PSM) method to match the treat group and control group. It is found that SMBOs underperform their matched counterparts of primary private-to-private MBOs in profitability, productivity, and growth, further confirming our main results. Notably, our results show a decreasing trend in profitability, productivity, and growth from the first to the fifth post-SMBO year. These results regarding the whole sample conclusively suggest that SMBOs underperform after transactions, consistent with our buying time hypothesis and some previous studies (e.g. Jelic and Wright, 2011). The univariate analyses on post-SMBO operating performance in Chapter 3 and Chapter 4, with reference to different sample sizes, also obtained the similar results.

Furthermore, we considered the heterogeneity of SMBOs and divided the entire sample into subsamples in terms of PE backing, exit routes, and the holding period in primary buyouts, in order to obtain deeper insights into post-SMBO operating performance. By comparing the median value of operating performance across these subsamples, it is firstly found that compared to SMBOs exited through tertiary MBOs, SMBOs that are exited through going public and trade sales perform better during the secondary round. Second, however, we find mixed evidence on the prediction of superior performance of PE-backed SMBOs compared to their non-PE-backed counterparts. Particularly, we find that PE-backed SMBOs only outperform non-PE-backed SMBOs in productivity and growth a certain number of years after SMBOs. Third, although it is inconclusive, the results show that ‘early’ exited SMBOs seem to have better post-SMBO operating performance than the

'late' exited SMBOs. These empirical results indicate that although SMBOs underperform after transactions based on whole sample, there are still possibilities for some SMBOs to perform better than others, and not all SMBOs are bad deals.

The results for the impact of leverage and managerial ownership do not support our hypotheses. We even find that leverage (measured by debt coverage) is significantly and negatively related to post-SMBO operating performance in terms of profitability and productivity, although the magnitudes of the coefficients are very small. The results are robust to different leverage measures and regression models. It is inconsistent with prior studies on primary buyouts and indicates that high leverage is a one-off value creation mechanism. Once the high leverage has been used in the primary round, it will not benefit the target companies in the secondary round; rather the opposite, it will increase the failure risk of the target companies. Surprisingly, we do not find any convincing evidence on the impact of managerial ownership on post-SMBO performance, which is also inconsistent with prior studies. The results indicate to some extent that the management holding ownership for the incentive alignment in the secondary round cannot motivate the management to obtain the same achievement as in primary round in terms of the operating performance. Because both leverage and managerial ownership are used to solve the agency problems, the results also suggest the invalidity of agency theory that explains value creation in SMBOs.

This chapter contributes to the small but growing literature on SMBOs by using the most comprehensive UK SMBO dataset to date. Unlike the prior studies that focus on the motivations of SMBOs and returns of this kind of investment, or only investigate short term post-SMBO profitability and long term post-SMBO operating performance in the early 2000s, this study has fully examined the long run post-SMBO operating performance in

profitability, productivity, and growth of UK SMBOs from 2000 to 2007, together with the determinants of these performance. Besides, previous studies on SMBOs only investigate PE-backed SMBOs, while, as other types of buyouts, SMBOs also include non-PE-backed deals. Hence, we contribute to the current state of research by dividing our sample into PE-backed and non-PE-backed SMBOs and examining the operating performance and determinants separately.

Furthermore, we offer the first empirical evidence on whether the typical corporate governance mechanisms of buyouts, leverage and managerial ownership, in buyout organization can drive the performance in the second buyout round in a panel dataset. The governance efforts of leverage and managerial ownership are brought into buyout literature by Jensen (1986) in public-to-private (PTP) circumstances, supported by a glut of empirical studies by still using PTP samples. However, along with the development of PE and buyout markets, the composition of buyouts have changed dramatically with PTP deals only accounting for 6.7% of the total amount of LBOs between 1980 and 2007 (Strömberg, 2008). Therefore, the notion of the positive influence of leverage and managerial ownership on post-buyout operating performance is confounded. Our findings in Chapter 2 contribute to further understanding the effects of leverage and managerial ownership in value creation, especially operating performance improvement.

Chapter 3 investigated changes in the board of directors from the primary stage to the secondary stage and examined the relationship between the new board compositions and the post-SMBO operating performance, using the data of 262 UK SMBOs completed from 2000 to 2007.

The univariate analysis of the comparison of the board composition before and after SMBO transactions evidences that SMBOs on average have a higher fraction of PE-related

directors and a lower fraction of independent outside directors than their primary stage counterparts. Furthermore, PE-backed SMBOs on average experience significant increases in board size and the fraction of PE-related directors, while the fraction of inside directors after transactions decreases. In contrast, non-PE-backed SMBOs on average experience significant decreases in board size, the fraction of PE-related directors, and the fraction of independent outside directors, but significant increase in the fraction of inside directors after transactions. In other words, compared to non-PE-backed SMBOs, PE-backed SMBOs tend to increase the board size, nominate fewer inside directors, and be more likely to replace top managers (CEO/CFO) and have skilled insiders on the board in the secondary stage. These findings show a significant transformation of board composition of the target companies after SMBO transactions and the PE-backed SMBOs in particular are actively injected with fresh and diverse blood.

Our main multivariate results in Chapter 3 show strong evidence that the more PE-related directors on the board, the better SMBO perform in profitability, productivity, and sales growth, suggesting that PE firms taking seats on the board is still an important mechanism of performance improvement. This is because new PE-related directors possess various idiosyncratic skills, experience, and capabilities to exploit the growth opportunities and boost the operating performance. More PE-related directors mean more resources available. Alternatively, some SMBOs of our sample were non-PE-backed in the primary round, so the high fraction of PE-related directors in the secondary round contributes to the elimination of agency problems. As a consequence, SMBOs with more PE-related directors perform better, especially in terms of profitability. This finding is consistent with previous studies (e.g. Cornelli and Karakas, 2013). Moreover, recruiting skilled inside directors is also one of the main mechanisms to improve post-SMBO performance, especially

regarding employment growth and sales growth. Unlike PE-related directors, skilled inside directors not only possess idiosyncratic knowledge, skills, and networks, but they also have comprehensive information about the target companies and are motivated to utilize their competitive advantages to exploit growth opportunities. In addition, changing top managers only improves the post-SMBO operating performance in sales growth. Nevertheless, we do not observe consistent evidence on the significant influence of board size and the fraction of independent outside directors. On the whole, the results imply that appointing PE-related directors and/or skilled inside directors are efficient ways to enhance target company performance in SMBOs, in comparison with other ways, for example, changing top managements and appointing independent outside directors.

To more deeply understand the influence of board compositions, we conducted some further analyses concerning some special circumstances. Our results reveal some evidence that the high reputation of PE firms alleviates the relationship between the fraction of PE-related directors and post-SMBO performance, indicating that highly-reputed PE firms tend not to use taking seats as a way to create value and might choose a good deal to invest in instead. We also find that changing top managers, recruiting independent outside directors, and having skilled insiders improve post-SMBOs performance in the subsample of SMBOs exited early by primary PE firms/ managers. In contrast, increasing the number of PE-related directors is the only way to improve post-SMBO performance in the subsample of SMBOs exited late by primary PE firms/ managers. When the SMBOs still have potential to improve performance, PE firms prefer to adopt alternative ways to enhance the boards' efficiency, rather than taking seats on the board with their own people, in attempt to control the costs. Oppositely, when there is little room for SMBOs to obtain improvement, PE firms will take more seats on the boards to avoid the failure of their investments.

Our findings extend the current literature on the board of directors in buyout and even in private companies. The current literature on the board of directors is mainly for public companies. Moreover, the few studies on buyout's board are almost all to examine its monitoring function that engages in eliminating agency problems. Nevertheless, agency problems are not the main problems in SMBOs. How to improve the corporate governance and obtain operational gains in SMBOs becomes the biggest challenge.

Grounded in strategic entrepreneurship theory and the theory of the board of directors, we argue for the importance of the advisory function of the board of directors on generating strategies to create wealth in SMBOs. In Chapter 3, we found that the board composition in SMBOs, PE-backed SMBOs in particular, tends to enhance its advisory function. And the respective new board composition mainly contributes to the post-SMBO operating performance in growth which we use for strategic entrepreneurship theory. This chapter, therefore, provides new insights on the board of directors, even the corporate governance, in buyouts and private companies.

The review of the literature on the motivations of SMBOs suggests that buying and selling fund pressures motivate selling PE firms to exit their deals via SMBOs while buying PE firms are keen to invest their untapped capitals in SMBs. It also suggests that the variety of PE firms also propels SMBO deals. However, no studies have been conducted to provide evidence on how these incentives impact on post-SMBO performance, except for Jenkinson and Sousa (2013). Chapter 4 aims to fill this gap by investigating whether the longevity of PE funds (fund pressures) from both the buying and selling sides affects the PE firms' decisions on investing good or bad deals in terms of post-SMBO operating performance and whether the characteristics of PE firms (competitive advantages) have an influence on post-SMBO operating performance.

Our results show that when the buying PE fund comes to the end of its investing period, SMBOs underperform in terms of employment growth and sales growth. However, this result is driven by the industry factor. Moreover, our results document some evidence that when the selling PE fund is approaching the end of the fund life, SMBOs perform better in profitability. We also find that the positive relationship between the length of the remaining time until the end of the fund life of the selling PE fund and the post-SMBO operating performance in profitability is stronger when the selling PE fund exits early, suggesting the performance improvement potential left by selling PE firms. These results are consistent with, but not strongly supportive of, our hypotheses to some extent. We suggest that the fund pressures mainly affect the bargaining power of PE firms when negotiating the deal prices while not the real quality of their investments. Particularly, buying PE firms under buying pressures does not chase bad deals, in despite of it being more likely to pay a higher price. They actually screen the deals to invest in good deals.

To investigate the influence of the characteristics of the buying PE firms on post-SMBO performance, we use industry experience, the number of investments per executive, and buyout/acquisition stage specialization as proxies for the characteristics (competitive advantages) of PE firms. Our findings provide evidence that more industry experience and a lesser number of investments per executive of buying PE firms lead to better post-SMBO performance in terms of productivity and growth of both employment and sales. However, these results are driven by industry factors. These results are robust when we correct for sample selection bias. Our main results prefer that buying PE firms tend to invest in good deals with growth potential instead of making efforts by themselves to improve the performance of target companies. This also supports to the strategic entrepreneurship theory to some extent, as all the improvements are concentrated in employment growth and sales

growth.

Moreover, we find that when SMBOs have performance improvement potential, the impact of buying PE firms' characteristics on SMBOs' operating performance is weakened.

However, when we restricted our sample to SMBOs that are backed by PE funds with a limited fund life, the characteristics of buying PE firms appear to have significant relationships with post-SMBO performance in terms of productive and growth ratios. These results support the heterogeneity hypothesis and indicate that buying PE firms actually do have incentive to exploit opportunities to improve SMBOs' performance, especially productivity and growth performance, provided that there are potential fund pressures.

Chapter 4 first contributes to the growing literature on the heterogeneity (various competitive advantages) of PE firms. The current studies suggest that the heterogeneity matters in influencing on the success of buyout transactions, while little is known about its influences on the target companies' operating performance. To the best of our knowledge, there is only one study (Jenkinson and Sousa, 2013) examining the relationship between the respective experience of the selling and buying PE firms and post-SMBO profitability. From this perspective, Chapter 4 not only provides some evidence on whether the competitive advantages of buying PE firms improve growth performance after SMBOs, and provides new insights on strategic entrepreneurship theory on SMBOs, but also to some extent explains the conflicting behaviors of buying PE firms when using their competitive advantages to spur the performance improvement.

Moreover, our result contributes to the small but growing literature on the agency conflicts between the general partner and the limited partner. Under these agency conflicts PE firms might overinvest or adversely invest in bad deals, in order to seek their own benefits. SMBOs provide an opportunity to examine whether agency conflicts between the

general partner and the limited partner affect PE firms decision on making investments. However, previous studies mainly use fund level data. Chapter 4 investigates these agency conflicts from the company level by investigating whether under fund pressures, PE firms will choose to invest in easily accessible but bad deals.

Finally, this thesis is one of the few studies that adopt alternative theory (strategic entrepreneurship theory) rather than agency theory to explain the entrepreneur activities in buyouts and the first study that uses strategic entrepreneurship theory to explain post-SMBO operating performance. Through examining companies' growth and the determinants thereof, which is supported by strategic entrepreneurship theory, we find that although typical SMBOs underperform after SMBO transactions, better growth performance can still be achieved by enhancing the advisory function of the board of directors (e.g. having more PE-related directors and skilled inside directors on the board) and, or to some extent, by buying PE firms with competitive advantages. This is because all these determinants bring in new and unique resources, knowledge, experience, and skills into the target companies and help the creation of new strategies. This thesis, hence, extends the theory background in the buyout literature.

It is worthy of presenting several limitations of this thesis, other than the limitations we present in Chapter 3 and 4. First, the three empirical chapters use accounting data. Our results might be subject to potential managerial manipulation of the reported accounting data, as private companies are not required to report their accounting information to the public. Second, the results and conclusions of the empirical methodology could be sensitive to the choice of model specifications and variable measures. Although the GLS random-effects panel regression used in this thesis is always not supported by empirical and econometrical researchers, the nature of our dataset, misspecification tests, and post-

estimation tests suggest that this is the best estimation methods currently for our research. Third, as we manually collect the most of our independent variables, these variables may subject to measurement errors. But we believe the effects of these potential errors have been minimized. Fourth, we only consider the endogeneity relationship between the board size and post-SMBO operating performance. Other governance mechanisms, such as managerial ownership, or board compositions (e.g. skilled inside directors), might also be endogenous. However, we do not address these issues here due to a lack of relevant data. Finally, we treat incentive alignments as a whole through managerial ownership. Accordingly, incentive alignments come from various sources.

The new phenomenon of growing SMBOs creates many promising research ideas for the researchers. Although there are some studies on SMBOs, our study still could be extended in several ways in terms of data coverage, research method, and research topics. We so propose these promising ideas for future research as follows.

First, in this thesis, we collected data during period from 2000 to 2007, in an attempt to obtain enough long term post-SMBO operating performance data. As a consequence, all the SMBOs were completed before the recent financial crisis. The current study makes an important conclusion that the current SMBO wave was driven by the 'hot' credit market and 'cold' equity market during this period. However, after the financial crisis, when the equity market recovered, while credit market cooled down, the number of SMBOs still has been growing fast. We do not know the motivations, the fund performance, and post-SMBO operating performance of the SMBOs completed after financial crisis, after 2010. We suggest that, based on our current research, the target companies might have value creation potentials, especially growth potentials, to attract the buyout investors. Further research is required to include data after 2010.

Second, we observe the crucial role of the board of directors in improving the strategy and growth performance of the target companies in SMBOs and highlight the importance of PE-related directors and skilled inside directors. Nevertheless, due to issues of data availability, we do not know exactly the background or expertise abilities of these directors and how they use their expertise to facilitate the operational strategies in SMBOs. Because the board of directors is a breakthrough of overcoming the challenge of corporate governance in SMBOs, we suggest further research to closely investigate the expertise and behaviors of these directors by case study, interviews, or questionnaires that are commonly employed by the management literature.

Third, this thesis adopts employment growth and sales growth as measures for entrepreneurial activities. Data on innovations, research and development, the market segments expansion, or subsidiary may provide more and deeper insights on whether SMBOs focus on their long run strategic expansion instead of profitability gains by eliminating the agency issues.

Fourth, when we examined the continuous effects of the incentive alignment in SMBOs, according to the literature, we used managerial ownership as a signal and whole proxy. However, the case study conducted by Achleitner et al. (2012b) and the theoretical studies of Elitzur et al. (1998) suggests that there are various purposes motivating management to invest in SMBOs/MBOs and aligning/disposing their incentives with the other stakeholders. More detailed data on these purposes could offer new insights of the effects of incentive alignment in SMBOs and even the longevity of the superior governance of buyouts.

Fifth, our findings show a significant negative impact of leverage on post-buyout operating performance, profitability in particular. A question arises why bankers or loan

providers still offer huge debt to support SMBOs, because low operating performance means high failure risk of the companies and the high risk of their loans. The literature suggests that the confidence of bankers in companies that have already been bought out and the high debt capacity of target companies could be the reasons of their continuous investments in SMBOs. Further research could investigate the real reasons from the aspects of banker or loan providers.

Finally, we investigated the post-SMBO performance from the PE firms' perspectives. It will be interesting to investigate the motivation of the portfolio managers on SMBOs and the relationships between their background and the investment returns or target companies' performance.

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